The Veterinary Record.

(*Founded by William Hunting, F.R.C.V.S., 1888.*)

No. 42. OCTOBER 17, 1925. Vol. 5.

The Problem of the Tuberculous Cow.*

By Arthur Gofton, F.R.C.V.S.,
Chief Veterinary Inspector, Edinburgh.

Primarily, this Conference is concerned with Public Health questions, but it is not sufficient to consider the tuberculosis problem from the public health standpoint alone. To the economic side too little attention has been directed; it has been almost lost to sight in the greater prominence which has been given to the influence of the bovine disease on human health. The facts in connection with the latter are so well known that repetition would be superfluous. I do not propose, therefore, to do more than quote Dr. Stanley Griffith's figures as to the prevalence of the bovine disease in the human subject. His figures are chosen because there are no others which are more representative or which cover such a wide field. Further, Dr. Griffith's record of work in connection with tuberculosis enables him to speak with an authority which cannot be challenged. In Vol. XXIII. (1920) of the *Journal of Pathology and Bacteriology*, Griffith reports that in an unselected series of 1,068 cases of human tuberculosis investigated in this country by identical methods, 20.7 per cent. were attributable to bovine infection. Examination of the figures shows an incidence of 37.55 per cent. of bovine disease in children under five years of age, with progressive diminution to 6.25 per cent. from sixteen years of age upwards.

From the point of view of animal health, there is no disease of cattle of even approximately equal importance in this country and none which is responsible to anything like the same extent for loss to the stock-owner and to the community. At first thought there may be a temptation to question the truth of the latter statement in view of the large bills which the nation has lately been been called on to pay as the cost of eradicating foot-and-mouth disease. But it will be realised on consideration that, over a period of thirty years, foot-and-mouth disease was quite negligible in its economic effects in this country apart from the altogether abnormal experience of the years 1922 to 1924. In any case, it is not possible to arrive at any comparable figure in respect of tuberculosis because, whilst the cost of foot-and-mouth is borne, for the major part, by the nation, and can thus be expressed in cash values, the loss from tuberculosis falls on a multitude of individuals, and no means exist whereby the necessary information can be collected and collated. Some facts, based on experience in Edinburgh abattoirs, will, however, be given in order to show the economic influence of bovine tuberculosis in comparison with all other diseases of cattle when considered collectively.

*Presented to the Veterinary Inspectors' Conference held in connection with the Royal Sanitary Institute Congress, Edinburgh, July, 1925.

It is further to be remembered that bovine tuberculosis continued to exercise its influence without modification year after year and, so long as the present policy of almost complete inaction remains in operation, bovine tuberculosis will continue to be responsible for a consistently recurring animal loss to the community.

During the three year period, 1921-1923, the records of the Edinburgh abattoir show that tuberculosis was responsible for 82.35 per cent. (by weight) of carcases condemned, 88.13 per cent. of heads and 44.12 per cent. of edible offal. With the exception of offal, which is of relatively small value, it will be observed that the whole of the non-tuberculous diseases (including traumatism) account for only a comparatively small fraction of the total condemnations. In an article published in *The Milk Industry*, for March, 1924, I ventured to make an estimate of the actual cost of tuberculosis as represented by slaughterhouse condemnations in the city. Taking a very low average of the prices current in the local dead meat markets during the year 1923, the sum of £5,000 was arrived at as the annual total. Edinburgh is only one meat consuming centre and by no means the largest. There is no reason to suppose that the experience of Edinburgh differs in any material respect from experience elsewhere. It will be readily appreciated, therefore, that if the slaughterhouse condemnations on account of tuberculosis throughout the whole of Great Britain be taken into account, they represent an annual loss of very considerable magnitude.

It must not be forgotten that slaughterhouse experience is only part of the picture. The tuberculous animal is often slow and costly to feed. When ultimately sold in the fat stock market, loss rather than profit too frequently results. Many dairy cows are disposed of prematurely on account of tuberculosis during their most productive age period and entail a definite loss to the dairy. And there are the numerous miserable unfortunate piners which never reach an abattoir, but whose career is prematurely terminated at the knackery or by burial.

Sufficient has probably been said to make it clear that the economic aspect of the tuberculosis problem is only one degree less important, in the national interest, than the influence of the disease on human health.

An effort to arrive at an estimate of the numbers of tuberculous animals which constitute an active danger to human health will perhaps serve a useful purpose. It is scarcely necessary to say that, in this connection, meat, in comparison with milk, is relatively negligible as a medium of infection for man. The reasons which justify this statement have been so often expressed, and they are so obvious, that repetition is unnecessary.

Published records of the incidence of tuberculosis in Great Britain are relatively few and, in most cases, they do not embrace a large number of animals. It is, however, generally estimated that 40 per cent. of all dairy stock are affected with tuberculosis and, taking cows of all ages into consideration, this figure is approximately correct. When the majority of the animals under consideration are of mature years, that is to say over five or six years, this figure is almost constantly exceeded. Thus, in Edinburgh during the five year period, 1920-1924, 16,249 cows passed through the abattoirs and, of these, 7,277 or 44.78 per cent. were shown to be affected with tuberculosis.

Tuberculous infection of milk is attributable mainly to cows which fall into two categories, namely, (1) those with tuberculous mastitis, and (2) those with acute, actively progressive tuberculosis accompanied by rapid loss of condition. In addition, the emaciated tuberculous cow and a very small number of cows, which, though affected with tuberculosis, show no clinical manifestations of the disease, are known sometimes, but not constantly, to eliminate tubercle bacilli in the milk. It might be said with truth that every tuberculous cow is a potential disseminator of infection to man through the agency of the milk, but, in fact, the numbers which are actually responsible for human infection by this channel represent a relatively small proportion of the whole.

As to the number of cows affected with tuberculous mastitis, 0.77 per cent. (1 in 142) of the cows slaughtered in Edinburgh abattoirs during the five year period, 1920-1924, showed macroscopically recognisable lesions. This percentage has varied within very narrow limits from year to year and, as it represents the result of the *post-mortem* examination of the udder of 16,249 cows, it may be accepted as a fairly accurate indication of the prevalence of tuberculous mastitis. In passing, it is perhaps desirable to state that tuberculous mastitis should not be regarded as necessarily constituting evidence of fairly advanced tuberculosis or of tuberculosis which has become generalised by blood stream infection or otherwise. Our experience in Edinburgh slaughterhouse is to the effect that tuberculosis is generalised in 48.2 per cent. of the cows affected with tuberculous mastitis. In the balance of approximately one half, evidence of blood stream infection is absent and the disease is localised in character. Indeed, it is not uncommon to find a tuberculous mastitis in association with a very limited distribution of tuberculosis in the carcass and viscera.

It is quite possible that a sense of alarm, which would not be justified, might be created if the figures were quoted showing the number of cows totally condemned on account of generalised tuberculosis, *i.e.*, tuberculosis in which *post-mortem* disclosed evidence of blood stream infections or in which, in the absence of blood stream infection, the disease was widely distributed throughout the carcass and viscera. Our slaughterhouse records do not differentiate sufficiently between the different types of case which led to total condemnation, to permit selection of those animals in which danger through the agency of milk arose, and those in which it did not occur, or was at least highly improbable. If, however, one might venture, without undue indiscretion, to make an estimate, based on one's personal experience, of the number of dangerous cows, including those affected with tuberculosis of the udder, it would seem probable that the number falls somewhere between one and two per cent.

From the public health point of view, it is more important to realise that the distribution of the dangerous cows is by no means uniform. Concentrated infection and frequently recurring infection are well known in relation to supplies drawn from herds in which the disease is very prevalent. It would be easy to quote specific instances in illustration of this statement. Further, it cannot be assumed that, because a supply is drawn from a large herd, infection, if it occurs in the milk, will be so diluted by admixture with non-infected milk as to be almost negligible in its effects. It is not a universal practice to bulk the milk from a whole herd. On the contrary, it is quite common to find with a large herd that the milk in any individual container as prepared for distribution is representative of, at most, half a dozen cows. So that the position in regard to infection is frequently the same whether the herd be large or small.

In any campaign directed against bovine tuberculosis attention must, in the first instance, be concentrated on those animals which are a source of human infection. The Tuberculosis Order of the Ministry of Agriculture which has been promised to become operative coincidently with the Milk and Dairies Acts on the 1st September of the current year, will, without doubt, resemble its predecessor of 1914 in that it will confer power to control the movement and to ensure the slaughter of such animals. It should, however, be clearly recognised that the Tuberculosis Orders of 1913 and 1914 were in reality public health measures and were not primarily intended to control or to eradicate bovine tuberculosis. Unless the new Tuberculosis Order is more ambitious than its predecessors, which seems unlikely, it will certainly not eradicate bovine tuberculosis, nor can it be expected to reduce the incidence of the disease to any material extent. It will only contribute to the latter result in so far as it ensures the removal and destruction of those animals which are most active distributors of the seeds of infection amongst their fellows. The number of animals found to fall within the scope of the Order will, no doubt, be greatest in the first few years of its operation, but it will not prevent a recurring, though perhaps smaller, crop of these animals year after year. It must, however, be acknowledged that a Tuberculosis Order on the lines of that operating in 1914 represents a first and essential step in any scheme for the control of bovine tuberculosis.

The Milk and Dairies Acts provide, *inter alia*, for regular periodical clinical inspection of dairy cattle. In addition, the Scottish Act requires notification to the Local Authority by the cowkeeper of any cow in his possession which is suffering from any disease liable to infect or contaminate the milk, or any cow

which, to his knowledge, is giving tuberculous milk. Provided, therefore, that the Acts are uniformly administered, particularly in the rural areas, the machinery for the early detection and recognition of the dangerous tuberculous cow, and for her effective and permanent removal from dairy stock under the Tuberculosis Order, will become operative in September. And a move forward of very material value in the interests of public health will have been made.

Whilst the Acts and the Order will, it may be reasonably be expected, go a long way to minimise the danger of tuberculous infection from milk, they will not wholly remove it. Further, they leave the economic side of the tuberculosis problem almost untouched. They, nevertheless, represent as much as could reasonably be undertaken as a first step in legislation on the subject. Both for economic and public health reasons the ultimate aim should be the complete eradication of tuberculosis from dairy stock, but before any material progress can be made in this respect the interest of stockowners must be awakened and their co-operation secured. The Milk (Special Designations) Orders and the long overdue official recognition which they have given to milk which is the produce of tubercle-free herds, have proved a stimulus in the right direction and, in addition, the public demand for such milk, which is the direct sequel of the Orders, has contributed to a definite, if slowly growing, movement amongst stockowners towards the complete eradication of tuberculosis from individual herds.

In the United States of America the movement in this direction is widespread and it is worthy of note that it was initiated at the instigation of a committee composed of breeders and members of the Livestock Sanitary Association. This committee, in 1918, passed resolutions for the purpose of accrediting herds which were tuberculosis free, that is to say, herds in which no animal affected with tuberculosis had been found upon two annual or three semi-annual tests with tuberculin by the subcutaneous or other approved method and by a thorough physical examination. Some little time after the movement was initiated, the Pure Bred Breeders Association demanded that in accredited herd work the test should be of an official nature and should be made by a veterinary officer of the Bureau of Animal Industry or a regularly employed state veterinarian, and the work of tuberculosis eradication has since then been carried out by the bureau in co-operation with the various states. In December, 1923, five years after the initiation of the movement, the official summary of the work, issued by the bureau showed a total of 35,895 accredited herds comprising 758,376 head of cattle, and 422,648 herds comprising 3,690,080 cattle "once tested free." The progress made in the short period is thus both remarkable and rapid, but the real weight of the movement behind the work of tuberculosis eradication in the U.S.A. is even more strikingly illustrated by the figures showing the total number of herds under supervision. The official statement shows that as at December, 1923, 580,986 herds comprising 5,909,377 cattle were under official supervision in connection with the work of tuberculosis eradication, and in addition there was a waiting list of 201,379 herds containing 2,170,247 cattle.

In Canada, a similar movement, under Government control and direction, is on foot in selected and restricted areas, and considerable progress has been recorded. But in Great Britain, neither the States nor the Canadian procedure is practicable at the present time, and if the problem of eradication is to be tackled, it must be approached more gradually. I do not propose to enter into a discussion of the methods by which the problem may be approached. This, in itself, would provide ample material for a separate paper and discussion. I would, however, make reference to a procedure recently put into experimental operation somewhat widely in this country.

In 1920, Calmette and Guerin described a method of vaccinating calves and young stock against tuberculosis which gives promise of very material aid in the solution of the tuberculosis problem. The procedure consists in the inoculation of calves within a short time of birth with living cultures of tubercle bacilli, the virulence of which has been reduced as the result of prolonged subculturing on media containing bile and glycerine. In the original experiments, vaccinated calves were housed over a period of thirty-four months with clinically tuberculous cows under conditions which favoured natural infection. The experiments clearly proved that the vaccinated calves acquired a high degree of immunity against infection. The vaccine is now available in this country, subject to conditions which will permit of test as to its practical value under farm conditions. Necessarily some time must elapse before this can be determined, but it can, with all confidence, be said that the vaccine offers greater possibilities of general applicability than any of its predecessors.

Discussion.

Professor W. Brown, B.Sc., M.R.C.V.S., Lecturer on Veterinary Hygiene, University of Aberdeen: From one point of view I have got to congratulate Mr. Gofton on his very excellent paper on this all-important problem of the tuberculous cow, and that is that he has given us many facts and figures which are entirely new and which are the result of his very careful observations in the abattoir for a period of years. But, as one who has the honour of opening this discussion, I must say he has left me with very few points really to discuss. That is probably all to the good, because I think the great success of yesterday's meeting was due to the conciseness of the statements made. Mr. Gofton has brought before us facts which reveal a state of affairs which should not be allowed to continue if we have a remedy to apply. In commencing to read the paper, I had hopes that Mr. Gofton would also go on to discuss the remedies, but he only mentions Calmette and Guerin's vaccine and indicates that would be a very good subject for a future conference. The evidence against the tuberculous cow as a danger to man has been strong for many years, and is greatly strengthened by this paper. But I cannot help thinking

that the real problem of the tuberculous cow—we know she is a danger to man and to the community and to other animals—is how she can be eliminated. On the first of September the Tuberculosis Order is to be re-introduced, which has for its purpose the elimination of cattle suffering from a certain type or degree of tuberculosis. Mr. Gofton does not think that the removal of these will have any material effect in reducing the incidence of the disease. In this I think he is rather pessimistic. I consider that with the removal of these animals a source, and usually a dense source, of infection to the other animals is removed, and I feel we are justified in expecting a noticeable reduction in the incidence of the disease after the Order has been in operation for sufficient time to get results. The most interesting statement in the paper is the remark that he makes that in one half of the cases of tuberculous mastitis there is no evidence of a blood stream infection or general infection. I am very glad that we got a further explanation of those lesions. because we had been taught to believe that in the great majority of these cases tuberculous mastitis was really of a secondary nature, and usually that the animal was infected with generalised tuberculosis. I should like to ask him if he thinks in many of those cases infection might take place *via* the teat, and if he has any reason to believe that infection might take place from human sources during milking. If so, tuberculous mastitis arising from a human source would, I fancy, be a very serious type so far as the human being is concerned. Now, I want to say a word or two about the eradication of the disease, because I am more particularly interested in that side of the question. I should like to remind this Conference of the report of the Astor Committee on this subject—that very important Departmental Committee of which Lord Astor was chairman. They made recommendations to which not nearly enough attention has been paid either by the Government or by the community. Amongst other matters, they appointed a Sub-Committee to report on the use of tuberculin. Our President to-day was Chairman of that Sub-Committee, and I should like to remind you in a word of its conclusions and recommendations. The first thing is that the manufacture, the distribution and the use of tuberculin is to be controlled by some central authority. The method adopted in carrying out and the interpretation of the tuberculin test are to be standardised, and the third is rather a negative idea which we will reach practically with the new Act—facilities to be provided out of public funds for free tuberculin testing, provided the farmer can supply satisfactory evidence that he has reasonable facilities for carrying out these tests and is willing to comply with the necessary conditions laid down. Such a herd shall be recognised as tubercle free, and a certificate shall be given to the effect that the herd was tested on a particular date and found free, and will be subject to retesting periodically. Now, these are important recommendations, especially the fact that it is necessary to have tuberculin standardised and controlled. Unless that is done, I feel we will not make much headway with regard to the elimination of the disease, because of the fact that it is so widely fraudulently employed. The second one, the method adopted in carrying out testing may be revolutionised now. Many of you will have read that very important document issued by the Medical Research Committee in connection with the use of the intradermal test. They showed that the subcutaneous test was inaccurate, but they were able to show that the intradermal test is a very accurate one. The first essential to the eliminating of the disease is absolute accuracy of diagnosis, because one tuberculous animal in a herd where an erroneous test has occurred may contaminate the whole. I hope also that it will be shown that the intradermal test will give a definite result, even although the animal has been doped. The first thing that I would like to say in the elimination of tuberculosis from a herd is that I am satisfied it cannot be done if the dairyman continues to go to the market for his supply of cows. The disease is so insidious and the tuberculin test sometimes so improperly carried out that you are sure to get a reacting cow in, which will upset probably years of work. I feel that the only method by which one can establish a tuberculous free herd is to breed one's own cattle, or else to buy cows from farmers who make it a practice to breed dairy stock for the milk trade. The method of segregating calves and rearing them in healthy surroundings is, to my mind, the only method which will succeed. These are my general opinions, and I am not going to keep you any longer, except to strike one personal note, if you will allow me to do so. As a veterinary surgeon, I want to say how pleased I am to see Dr. Leighton presiding at this Conference. (Applause). I know of no man who has done more—I know of no man who has done so much—to press the importance of the veterinary surgeon in connection with public health. Veterinary surgeons, especially in Scotland, owe him a deep debt of gratitude, not only for his public attitude but for the unfailing help and assistance he is always ready and willing to give in the course of his work on the Board of Health. Many of us had the privilege of being students under him, and I can assure him it is a memory that we cherish. (Applause).

J. S. LLOYD, F.R.C.V.S., D.V.S.M., Sheffield: With a great number of the figures quoted by Mr. Gofton I am in entire agreement, and I accept the conclusion which he draws from them. There are one or two remarks upon which I should like to say a few words, and the first is in connection with the sources of tuberculous milk from dairy cows. In 1901 I was working with Delepine at Manchester, and he often quoted a case where a cow was said to give tuberculous milk without being affected with tuberculosis of the udder. I do not know whether he ever changed his mind, because I have not been working with him since that date, but at that time he made a definite statement that when a cow gave tuberculous milk you could prove that she has got a tuberculous udder—if not by the eye, certainly by the microscope. Now, Mr. Gofton has mentioned, I think, four possible sources, and he later went on to minimise some of these sources, but I would like to go a little further and say that, in my opinion, he could probably throw three of them overboard. During the thirteen or fourteen years before the War, and the triennial period 1921 to 1923, I got negative results from the examination of milk of nearly 100,000 cows, to be correct it is 87,800. Now, if the sources of contamination were as stated by Professor Gofton, I feel certain there must have been some of the cows amongst that large number that

were troubled with the complaints which he enumerated, but according to biological tests they were not giving tubercle-infected milk, and for that reason I think that if we would confine our remarks and attention to cows that showed definite clinical lesions of tuberculosis of the udder, we should get rid of the chief sources of tubercle-infected milk. (Hear, hear). Following upon the statements made in the past, I have taken as many as six samples in one case from cows that were definitely suffering from tuberculosis and showing clinical symptoms of lung tuberculosis, and in no instance have I had a tubercle affected milk. I throw that out for consideration, and I hope other people will take it up and state their experience. Mr. Gofton also uses the word " generalisation," and Mr. Brown has copied him. Now I would like him to tell us what he means by " generalised tuberculosis." In the new Tuberculosis Order the notifications required are in connection with " advanced " tuberculosis, and I certainly like that term very much better than generalised tuberculosis. M'Fadyean stated some years ago that what he considered generalised tuberculosis was tuberculosis spread by the blood stream, and he went on to say that in those cases all the organs practically of the body, but more particularly the lungs, were tubercular, and practically constituted in the lungs tuberculous pneumonia. My experience has been that with such cows death occurs within three to six weeks. You get galloping consumption in cattle, and the cases in which I know from experience as a veterinary inspector that it does occur are mostly in connection with cows that have recently calved. It appears that the act of calving breaks up some blood-vessels, or something of that sort, and causes rapid infection, and the animals die very quickly. I would like, in passing, to say a word or two about the Tuberculosis Order. Mr. Gofton said in one case that it was only a very small step in the right direction, but I think if we get combined action under the Dairies Consolidated Act, coupled with effective energetic work under the Tuberculosis Order, we should get good results. It not only deals with cows giving tuberculous milk, to quote the words of the Order, or affected with tuberculosis of the udder, but it also deals with cows that have got a chronic cough. And I would like to emphasise the remarks just made by Mr. Brown, by stating that, in my opinion, the intradermal test is going to be of the greatest use to veterinary inspectors in carrying out the work under the Order in connection with such cows. It would take a clever veterinary surgeon to go into a shed and say that a well fed cow, having a slight cough, more or less of a chronic nature, which has been notified by a conscientious farmer or owner of cattle, has to be slaughtered under the Order. The intradermal test, I think, is going to be the weapon in his hand which will make it safe. In connection with the examination of samples of milk from cows with suspicious udders, in Sheffield we have been going this since 1901, and we have examined a tremendous number. I won't trouble you with the figures, but lately, since 1921, we have been carrying out examinations of such milks. I do not know whether anybody has done as much as we have, but in six out of every seven samples of milk from suspicious udders we are able to recognise tubercle bacilli which come from the milk of the animal showing clinical evidence of tuberculosis of the udder. Now, the advantage is that we are able immediately we find these bacilli to go to the farmer and say—and we do so by word of mouth and confirm it in a letter—that that particular cow is affected by tuberculosis of the udder and consequently it is illegal for him to keep that cow in the same shed or field as other cows, or to use or sell her milk for human consumption. I must say last December we were threatened with strong legal proceedings by a large dairy company because they said we were exceeding our duties. It is not always well to put all your cards on the table, and I carefully kept up my sleeve the fact that it was mentioned in the 1922 Milk and Dairies Act. Then, of course, when they got to know what we were relying upon, their proceedings dropped to the ground. I do not know that I care to take up your time further, but I would like to thank Mr. Gofton for supplying us with his paper in good time so that we could read it and study it. I hope you will not confine yourselves to what is in Mr. Gofton's paper, but do all you can to widen the discussion and get as many views as possible from different centres. (Applause).

Alderman W. Phené Neal, London: It is one of the great pleasures of public life that we are able from time to time to meet one another in a Conference such as this. I think that it is most useful because it disseminates ideas and it gives food for thought, which people may take away with them for further consideration. I think we are greatly indebted to Professor Gofton for the paper he has read to us. No one can leave this hall without being perfectly clear upon the facts which he has put before us. And therefore, if we really desire to profit, we should study them with care. I am merely a layman and I am looking at an audience which is almost wholly composed of well-known experts, therefore I am naturally at a considerable disadvantage, and I speak here with a good deal of diffidence, but I am aware that this disease of tuberculosis is of a very serious character, and I cannot help feeling astonished that a disease of this magnitude has been left so long without the Government of the day taking the matter up more seriously. (Hear, hear). We all know that cattle are subject to a great number of diseases. Two of them we have had lately before us. One is foot-and-mouth disease and the other is tuberculosis. The Ministry of Agriculture seem to have made up their minds that the policy for stamping it out, as I see in Mr. Gofton's paper, is the policy of slaughter. Whether that will ever be entirely successful remains to be seen. We read the other day that the country was completely free from the disease, but within twenty-four hours we read of an outbreak in Hull. Until the actual cause or origin of foot-and-mouth disease is ascertained, I do not believe we can ever say that we are wholly free from infection by that disease, but we do know this, that our forebears were not very much afraid of foot-and-mouth disease. They treated it, and there was a very minute percentage of actual deaths. There was, of necessity, a certain amount of loss, because the cattle had to be brought back into condition, but at the same time it was not a disease which killed off cattle in large numbers. But in tuberculosis we have a different disease. We have a disease which is very insidious, and which inevitably

leads to death, and it is for you gentlemen to discover the actual origin of the disease in order that it may be treated. It seems to me that tuberculosis is disseminated by actual contact of the animals. We are told in Scotland there are seventeen herds which are immune from the disease, and also in England there are reputed to be something like four hundred, but what I should like to know is this, is there any one of those herds that can be said to have been kept absolutely immune for a period of say five years? When I say immune, I mean the same cattle kept on the same farm for a period of five years without any appearance whatever of the disease. I remember quite well some few years ago reading of the experiment of Lord Astor. Lord Astor spent much money and gave every consideration to the subject, but eventually he abandoned the experiment. We are told we have immune herds in this country, both in Scotland and in England. What we want here is, in my opinion, distinct proof that immunity does actually exist on those particular farms. When I have discussed this with some of my friends of the veterinary profession they say, "Oh yes, that is so, but you must be very careful to see that these cattle do not come in contact with any other cattle from any other source." That is not a practical proposition, because when one comes to consider the milk supply of this country, one knows quite well that a large number of cows change hands week after week in our provincial markets, and how are you to alter that system? At the present moment, I have not the least idea, but it is perfectly clear that until you are able to immunise the whole country you cannot keep tuberculosis from being disseminated from one herd to another. When one considers the statement that you have got an immune herd, what does it mean? It means one of two things, so far as I can see. Either that you have to continue to breed the animals on the farm, and do that year after year, in which case if you do not introduce a sire from some other quarters you are in-breeding to an extent, which, to my mind, is almost certain to lead to disaster. If, on the other hand, you do introduce a new sire, you must introduce it from another herd. Now, unfortunately in the past, action has been known to be taken whereby, when the animal is tested at the time of the sale, it has been declared to be immune when, as a matter of fact, it is infected with tuberculosis, and therefore, there is a grave risk in introducing the sire from another farm unless you are quite certain that you are getting it from a frankly honest and straightforward vendor. I want just for a moment to carry you back to the year 1892. In the year 1892 we were receiving consignments of cattle from Canada, but suddenly one animal in the cargo that was landed, I think, in Dundee, was declared to be infected with pleuropneumonia. Immediately the Board of Agriculture, as it was then called, issued an embargo upon further importation, and from that day to this, with the exception of the introduction of a few Friesians, under a special order, we have had to breed from the same cattle that comprised the breeding stock of the country in the year 1892. I suggest for your consideration that the continual in-breeding in this country and in Ireland is not a source of strength. I suggest to you the time has come when we should bring in fresh stock, fresh blood, and that could be done by the introduction of heifers from Canada and heifers from South Africa. It is curious that only the other day we had a number of South African farmers over here in this country, and I had the opportunity of sitting amongst them one morning at breakfast and discussing the situation with them and I asked them whether they had tuberculosis existing over there. One farmer told me, "I have a large herd of cows, and they are periodically tested, and on one occasion I found symptoms of tuberculosis. That cow was immediately killed and on *post-mortem* examination there was a slight indication of tuberculosis in the carcase." He said that animal was bought in the United States of America. Since that animal was destroyed he said he had had no symptoms of tuberculosis in his herd, and I believe that is symptomatic of other cattle in South Africa. I have discussed this matter with some of my friends, and one told me, "If you introduced Canadian heifers that were perfectly free from tuberculosis, as soon as they got here, owing to the conditions in which they have to live, they will die off like flies." That is no doubt a very valuable opinion, but is it the fact? My old friend, Mr. McCombie of Aberdeen, I think, could tell us a good deal with regard to the introduction of Canadian cattle before 1892, and I doubt very much whether he would corroborate a statement like that, that when those heifers were brought over here with the steers on board ship and subsequently landed here and taken to various farms, these particular heifers in due course died off like flies. I do not think it is absolutely correct. But if we did introduce these heifers, and if we were able to mate them with bulls properly tested for the existence of tuberculosis, I venture to suggest for your consideration whether we would not be founding a new foundation of stock from which, in the course of four or five generations, we might be able to build up a new pedigree herd or herds which would be very much more immune to the fatal disease of tuberculosis. (Applause). There is a much larger aspect in this matter than perhaps some of you realise. The meat supply of this country is to my mind in a deplorable condition. You may travel for miles over meadows and pastures and you will never see twenty bullocks. In a country like this, with a population of over forty millions, does not it strike you that we ought to make every effort to produce home grown beef? (Hear, hear). How can that be done unless we increase the breeding stock? What is the good of our pedigree breeders taking up a position absolutely hostile to the introduction of any fresh breeding stock? We must either do that or do as we are doing to-day, stand face to face with a condition of affairs which under certain circumstances would mean famine. Let me give you one instance. As you know I come from the city of London. There the Corporation governs its own market. In the great meat market of Smithfield last year there were 480,000 tons of meat passed through that market, and some 16 per cent. or thereabouts of it was scheduled as home killed beef, and 14 per cent. of that home killed mutton. That small proportion of home killed meat, a good deal of which comes from Ireland either in the shape of dead meat or animals killed at Birkenhead—and a good deal comes from Scotland—is bought up by the well-to-do people in England.

Now, they are a very small proportion of the eight millions of people who are living in the metropolitan area, consequently it is quite true to say that the millions of people inhabiting the metropolitan area of London are absolutely dependant on imported meat. If we had another war, or if we had a prolonged strike, we should be in very serious difficulties, and it would tax all the energies of the Government to provide the people with the necessary meat for their daily existence. And when you come to couple that with the knowledge of the supply of bread stuffs, it becomes even more serious, because to-day we are growing a good deal less than one-fifth of the bread stuffs we are consuming. That means we are eating, supposing it were all divided equally, less than one loaf to every five consumers that is made from home grown material. But in London, owing to the fact that most of our home grown food is eaten in the country, it is perfectly true to say the Londoner does not receive the equivalent of one loaf in every ten he eats made from material grown in this country. Therefore I say, on that question of bread and meat (the two staple products of this country), that it is essential that agriculture should be stimulated and that we should produce both more meat and more bread. One way of helping the farmer is by the assistance of you gentlemen; you are experts in this particular branch of science dealing with disease. It is for all of you, whether you are medical men, whether you are professors in hygiene or sanitary science, to work hand in hand for the common and national good, and I was delighted to hear yesterday such expressions as we received with regard to that particular idea of mutual assistance. That is why I take personally so much interest in coming down to these meetings. I think that you are doing an enormous amount of good in the public interest, and I hope that while I have health and strength I may have the privilege of coming amongst you year after year as I have done for several years past and join you, not only here but elsewhere, in discussing matters of such great moment to the national good. (Applause).

E. J. Burndred, M.S., D.V.H., M.R.C.V.S., Blackburn: First of all I would like to say how fitting it seems to me that this subject should be discussed at this particular Conference. It has been recognised for a long time that Scotland was foremost in its interest in the veterinary side of public health and agriculture. Scotland has recognised what we in England have still to learn, that agriculture, as Mr. Alderman Neal has pointed out, is the backbone of the nation. Then, again, I was particularly pleased to hear Professor Brown of Aberdeen speak of our President. I know of no one who has taken a greater interest in the subjects which we are discussing at this time, and at all times, as Professor Brown says, his assistance has always been available when required, and not only that he has often led the way. I would also like to pay a tribute to Mr. Gofton for his courage in bringing forward at a public health conference the real issue in this problem of the tuberculous cow. The most important side is certainly the economic side, and that has been emphasised by previous speakers. We all know that the agriculturist has such a reputation for grumbling that, even if the public did recognise the tremendous importance of this problem, they would not take any notice of him. It would be almost impossible for him to make the public realise that his problem was also their problem to a greater degree almost than his own. The figures which Mr. Gofton has given, and which, as already pointed out, have been published, and therefore are of particular value, are very striking indeed, and it is unfortunate that in England, with the exception of a few places, we have not available such valuable figures to check the incidence of the disease. But it is very fortunate, as Mr. Gofton has pointed out, that although we have such a large number of cows infected, and as such they are potential disseminators of disease, that only a very small proportion do actually secrete tubercular milk. My experience both in farm inspection and public health supports that of Mr. Gofton, and in passing I would like to mention, although Mr. Gofton will certainly reply to Mr. Lloyd, that those cases which Mr. Gofton mentioned of tubercular milk being secreted occasionally by cattle which showed no evidence of tuberculosis of the udder, are definite cases and do occur in spite of Mr. Lloyd's figures, and they are not negligible. With regard to the cases of tubercular mastitis, I would also like to support Mr. Gofton. In practically half my cases the *post-mortem* examination of the cattle shows that the disease is localised to a great extent, and in many cases I simply find small foci in the lungs. From the public health standpoint that makes the disease rather more important than at first sight it would appear, and it makes us realise that the ideal would be the non-reacting cow, but in the meantime, as a number of us have already found by frequent periodical inspection, the elimination of tubercle bacilli in the milk can be controlled to a very great extent. And as Mr. Gofton has pointed out, there is not the slightest doubt that the Tuberculosis Order and the Milk and Dairies Act, if properly administered, will have a great effect in controlling the disease from that standpoint. But there is another point with regard to it which is worthy of attention from the economic standpoint and that is, if local authorities carry out their duties properly and deal with those cases which we from the towns and cities often find in the remote country districts, you will get at the reservoirs from which calves and pigs derive their bacilli. One of the most important aspects of the question was discussed yesterday, and that is the education of all people concerned. That is not only the breeder and producer of milk, not only the officials concerned, but also the members of the general public. It would be a sad day if the members of the general public, at the present time, were scared with regard to this troublesome problem, but to my mind the way to educate them would be to emphasise the importance of being prepared to pay for a pure food such as this. Therefore the Milk (Special Designations) Order has its usefulness in that all people concerned could explain to the public the reason for such an Order and the reason why such milks produced under such Order are increased in cost. I do not propose to discuss any other aspects in Mr. Gofton's paper, except to mention one particularly important point, and that is that indirectly mixed up with the problem of the tubercular cow as an individual is the problem of its environment. We all know that it is a disease more prevalent in cows than other members

of the bovine population, and I would just suggest that the housing of the cattle in my opinion has a lot to do with it. In conclusion, I would like to add my special thanks to Mr. Gofton for bringing forward this most important subject. (Applause).

Mr. T. PARKER, F.R.C.V.S., Newcastle: There are three or four points which I think are important. The subject which has been discussed to-day, is I think, really closely dovetailed into the one which was discussed yesterday. As a matter of fact, if the two papers had been read one after the other and a discussion followed, then I think the discussion would have been as a whole; you cannot get away from the one paper without the other. I propose to do what Mr. Lloyd suggested, and that is not to stick to the paper itself, but to refer to one or two points with which the paper is associated. In the first place, I would just like to throw this out—we should never confuse the question of a clean milk production with that of a clean milk with a tubercle infection. There is no question about it, the clean milk is absolutely essential, and while one is attempting to get clean milk one is doing everything essential to getting a non-tuberculous herd. It was said yesterday that in some places a better milk, a cleaner milk, had been got in very indifferent sheds than that which had been obtained in much better sheds. Well, it should be easier to produce clean milk in good buildings. It should be much easier to obtain that milk under better conditions. Under good hygienic conditions the cows are less likely to contract infection. Also, the animals are more likely to thrive better under good hygienic conditions than they would do under conditions where they are breathing ammonia and where there is want of light and air. Lastly, on that point, whenever you do detect disease in a cowshed, no matter whether it is a clinical case or otherwise, and if you have to remove the animal, there is greater difficulty in removing the disease from the premises after you have removed the animal if the premises are in such a condition that you can neither cleanse nor disinfect them. The next point is with regard to the Tuberculosis Order. What does it seek to do? It seeks to notify a certain number of conditions, but the point is as regards the conditions that are not obvious. What does the Order do to ascertain whether they exist? It does not impose compulsory inspection. They leave it to the agriculturists to detect the disease if they can. But the question arises, are they going to attempt it, and, if they could do it, are they going to do it? You have in the Milk and Dairies Act powers for the Ministry of Health to make orders for the inspection of animals, but unless that inspection is compulsory and you get regular inspection, then, of course, the conditions will remain exactly as they are to-day. There is, even in connection with the Tuberculosis Order, a subject which I think would interest Alderman Neal. In one part of the Tuberculosis Order, with regard to the imported animals, no animal can be imported into the country that is in such a condition that it requires to be notified in this country. That is to say, no animal having a tuberculous udder, and so on. On the other hand you find in the Importation of Animals Act, article 2, that it provides power for the Minister of Agriculture to make an order to allow cows to come from Canada to this country provided they have passed the Tuberculin test.

Alderman NEAL: It is not general, it is specific.

Mr. PARKER: He may make an order.

Alderman NEAL: But he does not.

Mr. PARKER: He may make an order to allow cows to come into the country provided they have passed the Tuberculin Test.

Alderman NEAL: The point is, it would be advantageous to this country if they were allowed to come in accompanied by a Government certificate, but the other point is that, although it would be advantageous to the country, the Ministry of Agriculture for some reason or other do not allow them to come in.

Mr. PARKER: To eradicate tuberculosis totally is quite one side of the question. The other side is the public health side; that is safeguarding the milk supply. I happen to be interested in an institution where there are children suffering from tuberculosis, and anyone who goes to these institutions must know that this question is something more than economic. Mr. Gofton referred to the percentage of tuberculous cows. He stated about 40 per cent. of all cows were infected with tuberculosis. Those figures were based on figures obtained in abattoirs. I would go further and say that the percentage in dairy cows is much greater than has been stated by Mr. Gofton. I think no one will know that better than Mr. Gofton himself. It is a difficult matter to examine a large number of carcasses to detect whether the animals have tuberculosis or not. What I am getting at is this; I had the opportunity within the last year or two of examining a large number of dairy cows. In one herd of 128 I found 100, that is to say, 78.9 per cent. diseased with tuberculosis. In another herd I found 81 per cent., and in another 72 per cent. I will just conclude by saying that the whole thing depends, in my mind, on this: in the first instance you must have clinical and medical inspection, and if you do that you can, to a certain extent, safeguard the human supply. (Applause).

Councillor JUDGE HARVEY, Convenor of the Public Health Committee, Edinburgh: I will certainly not keep you anything like five minutes, because, after all, it is a highly technical matter and I am here rather as a receiving set than a broadcaster. I want to say how I enjoy the veterinary meetings. I accidentally attended one at Hull two years ago and since then I have made it a point to attend them as often as I can. If I may dare to differ from one of the previous speakers who suggested it was not an economic matter, I should just like to state that we are, at the present moment, endeavouring to arrive at a state of perfection whereby we shall have a large supply of certified milk, and as that ideal is more nearly approached, the economic necessity will drive the stockbreeders to invent methods whereby they themselves will produce cattle free from tuberculosis. I do not want any more Government control. Government control, to my mind, always means expenditure, and the only time you can justify public expenditure is when there is a compensating public advantage. There is no compensating public advantage in slaughtering any cow which is not damaging the public health, and I feel that this matter will be settled economically when

the time comes when those responsible for the breeding stock in this country realise they cannot dispose of a tuberculous cow. Then necessity will be the mother of invention and the mother will be the economic situation. (Applause).

Miss HOWARD, Nova Scotia: I just wish to say that the breeding in Canada is not haphazard breeding. The breeding of the animals is done to a great extent under Government supervision. The sires are supplied by central agricultural colleges. Pedigree sires have been imported from England and Scotland, so that there is no fear of mixed strains from other parts of the world, which is the objection I have often heard made. I come from a province which has a similar climate to northern England and, as far as I can see, there should be no reason why they should not thrive in England, so that may I put up a plea that perhaps it might be tried? (Applause).

Mr. J. D. WHITEHEAD, F.R.C.V.S., D.V.S.M., Salford: I think it is only by bringing home to the agricultural community the immense amount of money they lose each year through tuberculosis, both directly and indirectly, that you are going to get the Farmers' Union to take any action. There is one point I am interested in in the tuberculous cow, and that is this; we have heard a good deal about getting a tuberculous free herd, we also heard yesterday about the difficulty of keeping a tuberculous-free herd free from infection. My point is that it is only the progressive farmer, the up-to-date farmer, who goes in for producing certified milk and tubercular-free cows; but then some men also go in for over-working their cows, which means that they lose the ordinary resistance to infection. I suggest to-day that the increase of tuberculosis among dairy herds is due to a great extent to the increase in the milk production per animal per annum, and I think that is one answer to the question. I also agree with what has been said regarding the housing. I think it is admitted, however, that tuberculosis increases in the human subject with overwork. If we stamped out the whole of the tuberculosis in one county and removed all the tuberculous cows into one county, I do not think that would even keep out the tubercle bacilli any more than our Orders keep out the foot-and-mouth organisms which come over occasionally. I am rather inclined to disagree with Professor Brown in this respect. He threw stones at the subcutaneous test; he said the Medical Council said it was unreliable. They did not say that. They said that under field conditions it was not as easy to get as accurate results, and the intradermal test is better for field conditions, but for laboratory conditions the subcutaneous test is still quite reliable. I also rather agree with Mr. Lloyd's remarks about generalised tuberculosis.

Dr. THOMAS EVANS, Medical Officer of Health, Swansea: I should like to ask Mr. Gofton whether he agrees with Mr. Lloyd of Sheffield that it is possible to make an accurate diagnosis of tuberculous milk by microscopical examination. Mr. Lloyd gave me to understand that at Sheffield they are now able to confirm by microscopical examination any suspected tuberculous udder. If that is so, it would be a great help because it would shorten the time. The other question I would like to put is, does he agree with the last speaker? Is there any scientific basis for the last speaker's statement that if you over-produce from your cow you are going to make it more susceptible to tuberculosis? Is there any scientific basis for the statement? I think these statements should not be made without a scientific basis.

Dr. W. M. WILLOUGHBY, Medical Officer of Health, Port of London: A cow which is made to produce two or three thousand gallons of milk per year is subjected to a strain which produces tubercle, and I think that is a thing that the National Society for the Prevention of Cruelty to Animals should look into. Such a cow does not produce milk which is any use to the human being, however delicate and tasty the stuff it may produce; it lacks the vitamines which are important. The other point that was raised was a biological point. We have heard something about in-breeding. The only experiment I know of was one where a brother and sister in guinea pigs have been mated for very many generations, and they have produced by the continuous in-breeding of brother and sister two absolutely strong healthy strains of guinea pigs, so diverse that the one is no longer a guinea pig, but the other is. (Laughter).

Mr. CLEMENT ELPHICK, M.R.C.V.S., Veterinary Inspector, Northumberland County Council: I would like to add my vote of thanks to Mr. Gofton for his very excellent paper. I am just going to refer to two things brought up by Professor Brown of Aberdeen. The first is with regard to the standardisation and control of tuberculin. I am wholly with Professor Brown on this point, and I may say that I was one of those who took this question up with the Veterinary Association in England, and it was carried, but, unfortunately, it was shelved by the Ministry of Health, a mistake which I think they will realise in the future. The next point Professor Brown rightly ventilated is one of vast importance as a link in this chain of the problem of the tuberculous cow, and the point at issue is with regard to the control of these reactors which are cast out of these herds which are being regularly tested under the Ministry of Health's scheme in the production of Grade A milk. They have got to go somewhere, unfortunately, and in Northumberland there is distinct evidence that these reactors are passing through our marts and markets, and so dangerous has it become that I personally got in touch with all the marts and markets of Northumberland and asked the auctioneers to set aside a special day for the sale of these cows. Unfortunately, that suggestion of mine has not gone on as I would have liked, but I do hope that this meeting will, through Professor Brown of Aberdeen, show its appreciation and determination that this point, if not both points, brought forward by Professor Brown, be submitted to the Ministry of Agriculture for their serious consideration.

Dr. W. J. HOWARTH, Medical Officer of Health, London: It appears to me that we, at the present time, are merely temporising. It is no use repeating that you must educate the farmer and educate the public; I think we ought to begin in the first place, by educating ourselves. I can name twenty or thirty directions in which research could very well be undertaken. I will only mention two. Can anybody in this room explain why tuberculosis in pigs is two-thirds avian? Why do you find so very rarely, if ever at all, tubercle in sheep? How infrequently do

you find it in the horse? These are problems by the solution of which you could probably do a great deal towards the determination of this problem set before us this forenoon. I appeal, as I appealed before, for greater attention to the fundamentals; there is no use trying to find a short cut. Let me give you an indication of what is being done at the research station in Cambridge with reference to such a matter as, say, the method of freezing meat to bring it from Australia. The research station goes down into the physics of gelatine, it goes down to the fundamentals of freezing albumen, and that is what ought to be done in connection with this problem. I simply mention these as illustrations of what I mean. I only want to ask one question of Mr. Gofton. He referred to this horrid word "generalisation," and stated that he would not accept tuberculosis of the udder as a condition of generalised tuberculosis. Personally, I would object to two words. The proper terms to use are "primary" and "secondary." I can tell you that there are localised lesions which render the animals unfit and there are generalised lesions which do not. I would rather use the terms "primary" and "secondary," because I know I can follow them up. If tuberculosis of the udder is not a primary or secondary lesion, what is it? How does it become a primary lesion? I only bring it in because it is an important scientific point. Is tuberculosis of the udder in the majority of cases a localised disease, or is it a symptom of a carriage of infection from some other parts of the body? Perhaps it may not appeal to everybody, but to me it is a matter of importance.

A DELEGATE: Professor Gofton mentioned at the end of his paper, and they have not been referred to, so far as I recollect, Calmette's experiments in the immunisation of calves, and I think myself that in this or some other form of immunisation lies our hope for the future, and it is by the country veterinary surgeons, such as I am myself, getting this vaccine of Calmette's and trying it out on calves to see if we cannot produce a race of cattle which will not take infection, that something might be done.

THE REPLY.

Mr. GOFTON, replying to the discussion, said: There have been a great many points raised, and it would be rather difficult to reply to them all individually. I have made a number of notes and I will try and deal with them, and perhaps if I go over these as they are jotted down here, avoiding duplication, it will save your time, and also give Mr. McAllan an opportunity of submitting his paper and having it reasonably discussed. Before I deal with the questions which I have jotted down, I would just like to answer two written questions which have been handed to me. The first asks whether it would be beneficial if any dairy farmer could from time to time send his samples of milk for examination as to whether the milk contained tuberculosis, and that facilities for this should be offered by the local authorities free of charge. I may say, so far, at least, as Edinburgh is concerned, if any farmer makes a request to have a sample of milk examined for the presence or otherwise of tubercle bacilli he has that done at once without charge. (Hear, hear). In all the big consuming centres it is the practice of the local authority consistently to take samples of milk for the purpose of submitting them to the biological test for tuberculous infection. Samples are purchased in shops on delivery, and in the event of any milk being found infective, investigations are made at the premises where that milk was produced. So that with the two working together I think the facilities are all there which the farmer can use if he likes to take advantage of them. Then a question was asked as to whether tubercular infection in milk may occur by contamination with dung. The most common seat of tuberculosis in the cow is the lung. In the great majority of cases it is open tuberculosis. I use that term with a little bit of trepidation, because objection has been taken to the use of the term "generalised," and I think the term "open" is open to at least equal objection. What I mean is that cows are actually coughing up tubercle bacilli in the expectorate. That may be coughed up on the walls or trough, or it may be swallowed, and in consequence tubercle bacilli appear in the fæces and are capable, from that source, of infecting other cattle. I have no personal knowledge of any case to which I could point and say: that is a case in which infection of milk has taken place from contamination with dung, but the possibility of infection taking place in that way is very obvious. Coming to the speakers, first of all I am very sorry I cannot agree with Mr. Brown that the Tuberculosis Order is likely to affect a noticeable reduction in the incidence of tuberculosis in cows. I wish I could believe it. I cannot believe it for the reason I have stated, that the great majority of cows are affected with tuberculosis in the lung and may cough up tubercle bacilli for long periods of time before they become suspects. Quite recently we made a *post-mortem* examination on a cow which was a reactor, which had very limited distribution of disease in the lung and throughout the carcase, but there were very marked lesions of tuberculous ulceration in the trachea. Such a cow does not come into the category which is included in the Tuberculosis Order, and so long as we cannot deal with that particular class of animal we cannot expect that an Order, limited in its scope as the Tuberculosis Order is, will do very much in the way of reducing the incidence of tuberculosis in cows. With regard to whether tuberculosis of the udder was indicative of advanced tuberculosis or not, I think that has been fairly fully dealt with, but I say without hesitation that tuberculosis of the udder in dairy cows may be a very early feature of the disease and a very early lesion. In dealing with that I perhaps might just refer to the questions which were raised by Dr. Howarth. Tuberculosis of the udder is without doubt a secondary lesion. It is also without doubt a lesion which has its origin by carriage from some other part of the body, but I differ altogether with Dr. Howarth when he says he does not accept the view that tuberculosis of the udder is due to a backward flowing of lymph. Now, I ought to guard myself there, because I do not think a backward flowing of lymph is a term which describes actually what takes place. When you come to what is the amount of the actual movement of lymph in the lymph vessels it is doubtful whether there is any flow in a real sense. There is, perhaps, little more than oscillation of the fluid in the smaller lymph vessels, and what actually takes place is not an infection due to a backward flow of lymph, but it is an infection due to a spread from a pre-existing centre of disease—the supra-

mammary glands, not being carried by a flow but extending through that more or less semi-stationary fluid to the substance of the gland itself. That, to my mind, is the explanation of the great majority of cases of tuberculosis of the udder. The question was asked by Mr. Brown, I think, as to whether tuberculosis of the udder ever arose from infection through the teat duct, also as to whether it was ever communicated to the cow in that way from human sources. I will deal with the last question first. I would point out what is a well established fact, that the bovine animal has a very high degree of resistance to the human tubercle bacillus. It was proved long ago that the human tubercle bacillus, when given in large doses, only produced a localised and retrogressive lesion in the bovine animal. It was known and proved that the human tuberle bacillus was capable of living even for very long periods of time in the lymphatic glands of the bovine animal, without producing any lesion, at least which was recognisable with the naked eye. Its presence was not recognisable by any ordinary means of examination outside a laboratory so that I think we may preclude altogether the possibility of a tuberculous lesion of the udder developing from human sources. That contamination of the milk may arise in that way is obvious, but that I need not deal with. As to the other point, whether infection ever takes place by way of the teat canal: after examination of a very large number of tuberculous udders I have only seen, in my experience, two in which the evidence suggested at least that infection possibly did take place by way of the teat canal. It is rather a curious fact also that those two cases arose within a few weeks of one another. They differed from what is rightly described as tuberculosis of the udder in that the lesions were distinctly nodular in character. An ordinary tuberculous udder is not a nodular lesion at all. The older lesions, in the cases in question, appeared at the base of the teat, and the younger lesions further up in the gland. The whole circumstances of these cases did suggest the possibility that infection had taken place by way of the teat canal. One can therefore say that while it does seem to be a practical possibility, it is not the frequent method of the infection of the udder. I will not touch upon the question of the standardisation and control of tuberculin, because I am very largely in agreement with what has been said, but I do want to say a word of caution with regard to the double intradermal test which has recently been recommended by the Medical Research Council. It has got its difficulties in application and interpretation. It has not been extensively applied throughout the country and we require to go with a measure of caution before we accept it as being a solution of all the difficulties which are encountered in the use of tuberculin. I am not prepared to go as far as the Medical Research Council in regard to condemnation of the subcutaneous test. I agree that it has its difficulties, that fallacies may arise in connection with its use and in the interpretation of its results, but I do not think we have sufficient evidence to justify us in saying, at least at the present time, that the double intradermal test has been proved to be so much superior to the subcutaneous. I say that without prejudice to either test. Now, I want to refer to a point which was raised as to the response which the farmer is likely to give to an offer to test his stock free with tuberculin. My experience in that respect is not encouraging. With the sanction of the local authority under which I work, a few years ago a large number of farmers were given that offer—free tuberculin testing, and advice as to the procedure necessary to carry out a system of eradication, and from the whole lot I got three positive replies, and it is rather interesting to follow the results. No. 1 had his cows tested once. He had something like 60 per cent. of reactors, and he went no further. No. 2 had his cows tested once, and took no further action. He failed to carry out the advice given to him or to comply with the conditions under which the test was employed, and I refused to go on with it. It was useless when he kept the tuberculous and the non-tuberculous cows side by side, and continued to keep them in that relationship. No. 3 carried it on for two years, and he was making progress, but he foolishly went down to the North of England. bought four cows and mixed them with the rest of his herd before testing. At the next test everyone of his cows went down bar one, and he went no further. Unless we can stimulate the farmer to realise that he has got something to gain by clearing his stock of tuberculosis, we are not going to make any progress at all. I want to differ a little from Mr. Lloyd with regard to the presence of tubercle bacilli in milk. Mr. Lloyd quotes Professor Delepine, whose experience was very extensive and who always spoke with care and with authority. He based his statement on the views of Delepine to the effect that tuberculosis of the udder can always be proved microscopically or otherwise to exist when tubercle bacilli are found in the milk. I will not dispute that statement, but I want to remind Mr. Lloyd that you cannot carry out a microscopical or laboratory examination in the byre; you have to depend on clinical symptoms, and I can say with confidence that you do get tubercle bacilli eliminated in the milk of tuberculous cows without clinical evidence of tuberculosis in the udder, without evidence in the udder of any recognisable symptom by which you could detect the existence of the disease. There is a further point of importance which bears on the other remarks made. The point I want to make is, how long does it take between the commencement of the infection in the udder and the appearance of clinical symptoms by which you can, in the course of an ordinary examination, recognise what is taking place? My experience is that a period of as long as eight or ten weeks may elapse during which cows are eliminating tubercle bacilli in the milk before symptoms appear by which tuberculosis of the udder can be recognised. I do not say it is constant, but I can quote definite cases in support of that statement. As to the cows other than those with tuberculosis of the udder eliminating tubercle bacilli in the milk, I can only say my experience differs from Mr. Lloyd's. I admit at once that the number of cows which are eliminating tubercle bacilli in the milk, apart from those with clinical evidence of tuberculosis of the udder, is small, but, at least, it exists. The question of the use of the term generalised tuberculosis was raised. I can only say I agree with those speakers who disliked the term "generalised tuberculosis"; it is one which has never had a very satisfactory or a very clear definition. But the fact remains that it has been given

what I may call an authorised or legal standing now in view of its use in the Public Health Meat Regulations in force in Scotland, and when I used the term "generalised" in my paper it had the significance which it has in the Public Health Meat Regulations. I would like just to clear up one point for Alderman Neal, because it is quite clear from his remarks that he does not quite understand the meaning of the term "immunity." That is not surprising. Alderman Neal prefaced his remarks by the statement that he was a layman, and it is because of the influence which Alderman Neal has in so many respects, and particularly in connection with the trade in cattle, and so forth, that I would try to make it quite clear to him what immunity does mean. It means that the animal possesses a power of resisting infection which prevents an infection, if introduced to the body, establishing itself there and giving rise to actual disease. Now, it is quite incorrect to say that it is claimed that tubercle-free herds which have been established in this country are immune from disease. They are not. They are just as susceptible as any other stock in this country. But what is claimed for them is that they are free from disease, but it is well known, and experience has proved it at the expense of those who have kept tubercle-free herds, that it is only necessary to introduce infection for it to become established in these tubercle-free animals. They are not immune. They are merely being kept free from infection. I am not going to be tempted into a discussion of the advisibility or otherwise of the introduction of heifers from Canada or South Africa. But I want it to be clear on one point, and that is, that neither South Africa nor Canada can claim that their stocks are free from tuberculosis. In both countries it exists. But I want to point out a danger which may arise if this argument with regard to freedom or comparative freedom from tuberculosis of these cattle from abroad is used as an argument in favour of their introduction. I am going to make a statement, and it may be when I have made it I will be the only person in the room who believes what I say. It is commonly held that the progeny of tuberculous stock inherits a tendency or special predisposition to contract tuberculosis if exposed to infection. I have never seen any evidence and I do not know of one single fact which would lead me to believe that that statement is true. I think it is a legacy from the old days when we used to believe that tuberculosis itself was an hereditary disease. What is it that has nearly killed out and wiped out the native of America? Tuberculosis and other diseases of the white man. And why? Because it has been introduced on to a soil which is particularly susceptible, particularly liable and particularly appropriate to receive the infection. And why is the soil appropriate? Because prior to its introduction the disease was never known to exist amongst the people. The people themselves had not, by a process of evolution, gradually acquired a degree of resistance and passed it on from generation to generation. In this country we have had the disease prevalent amongst us for many centuries, and we would all have been wiped out if there had not been developed and passed on from generation to generation certain amounts of resisting power which possibly are accumulating, and which have enabled a large proportion of the population to resist infection, or at least to withstand its attack if it were established in their body. (Applause).

If you bring into this country Canadian cattle, and pass them into our herds to mix with our stock in which infection exists, it seems to me you are not going to help the position with regard to tuberculosis, but you may conceivably make it much worse, in as much as you are introducing a soil which is probably more favourable for the reception of infection than our own native stock. Gentlemen, my time is up, but I want in one last word to express my absolute agreement with a further remark which was made by Alderman Neal, and it was also referred to by Mr. Brown and by one or two other speakers, and I am glad it has been mentioned. The remark referred to the need for and the advantage of co-operation in public health work. Personally, I have been associated with our Chairman, first, as a colleague in the Dick College, and later in our respective official capacities in the city of Edinburgh, and in the Board of Health, and I venture to think he will agree with me when I say that throughout the whole of that time, and particularly in later years when our work was more closely allied, there has been at all times willing co-operation on both sides. There has been nothing of greater advantage and greater assistance to me in my official work than the co-operation of my colleagues, and throughout I have endeavoured to make that my aim, I am quite satisfied that it has resulted not only in harmony, but it has resulted in progress in development of the public health services and in advancing the interests of the community. (Applause).

Dr. HOWARTH, Medical Officer of Health, London: I beg to move a vote of thanks to Mr. Gofton for his very admirable paper. This has been the most lively and interesting discussion I have ever attended. (Applause). I do think veterinary surgeons are to be congratulated on having men like Mr. Gofton and Mr. Brittlebank who can in a few sentences put forward a few principles which bring us to our feet.

The motion was duly seconded by Dr. WILLOUGHBY, Medical Officer of Health, Port of London, and carried unanimously.

EQUINE DEFENCE LEAGUE REPORT.

The annual report of the National Equine Defence League for the year 1924 has been published. A large section of the report is devoted to the export to the Continent of aged and decrepit horses, and states that between January and August, 1924, 5,384 horses were received in Holland alone for slaughter. The League claims that legislation in this matter must be transferred from the Diseases of Animals Act to the Protection of Animals Act, and advocates an amendment to the latter, decreeing that £10 shall be paid as Customs Duty, without exemption, on every horse, ass, and mule exported alive from the British Isles. In 1924 the League secured convictions in 20 cases of charges of cruelty in the London area. The report further deals with the conditions of pit ponies; the effects of overloading and slippery roads; and farriery competitions organised by the League. Among several reforms advocated are the substitution of motors for horses for mail vans and carts in London; the covering of chain traces with leather, as in the army; the invention of an instrument to test quickly the weight of loads; rubber bits; and also lighter and better-fitting shoes and harness, particularly collars. It is recalled that years ago a collar was made to fit a horse, and if he was sold, the collar went with him.

The Veterinary Record.

17th October, 1925.

REVIEW.

Official History of the Army Veterinary Services in the Great War.

(Reviewed by MAJOR-GENERAL SIR FREDERICK SMITH, K.C.M.G., C.B., F.R.C.V.S.)

Third Notice.

FRANCE AND BELGIUM.

In order to understand what follows a retrospect is necessary.

In the Veterinary History of the War in South Africa, attention was repeatedly drawn to the paralysis which occurred in veterinary arrangements when the responsible officer was not with the Head Quarters of the Army. On service, decisions have to be given forthwith and action taken at once; if the man who has to do this is some hundreds of miles away, the matter is dealt with by some one who, in all probability, is unfamiliar with the subject. When the war in South Africa was over the General Staff set to work to write a new Field Service Manual, based on recent experience. Later on, when my position at the War Office enabled me to have a small voice in matters of organisation, the draft of these Regulations as affecting the Veterinary Service was sent to me for observations. To my disappointment I found that the responsible officer of the Veterinary Service had again been located on the Line of Communication, instead of being allotted to Head Quarters, and accordingly the strongest exception was taken to the position assigned. No support was forthcoming from those responsible; in fact, if my observations were correct, the attitude of the General Staff to the ancillary services of an army was that they were regarded as rather a nuisance, and the further they could be kept away from G.H.Q. the better, for they not only increased the size of the staff, but added to the difficulties of messing, provision of servants and accommodation. One might have thought that the General Staff was arranging a select party for a picnic, instead of endeavouring to evolve the best possible organisation for a very grim business. Protests were of no use and in due course the Field Service Regulations appeared, the Director of Veterinary Services being assigned a position where the efficient discharge of his duties was not possible.

On the outbreak of war in 1914, this error in organisation was at once evident. It was not confined to France, but existed wherever arrangements had to be made for the evacuation from the field of all sick and wounded animals, or opinions given on the many questions of animal management which constantly crop up. Regulations are with difficulty set aside, and with still greater difficulty amended. Throughout 1914 no change was made in the position of the Director of Veterinary Services; early in 1915 he was brought on to the Head Quarter Staff, and in 1916 the regulation was amended.

Staff duties, whether of the fighting or ancillary services, have to be learned, but until a year or two before the war the subject was not considered necessary for the veterinary service; in fact, at one time staff officers of this branch were little more than clerks, and their office a clearing house for correspondence. The authorities regarded the position as so unimportant that I can remember the time when an Army List three months out of date was, on economical grounds, considered a suitable issue to the office of the Administrative Veterinary Officer. After the war in South Africa the question of staff training for ancillary services assumed a more favourable position, but there was considerable luke-warmness in allowing the veterinary service to be present during training in staff duties. A report furnished by Major (now Major-General) Butler during an important staff ride in the vicinity of Portsmouth, opened the eyes of the authorities to the value of such training for veterinary officers, and in the years following my retirement it became more generally adopted.

Prior to this, on one occasion before manœuvres, maps were requested for the use of my officers. The astonished look of the Chief Staff Officer can be recalled, also the acid remark that it was unnecessary for veterinary officers to follow military operations. It was evidently no use discussing that aspect of the case, but I reminded him that if he were so unfortunate as to have to leave his lame or injured charger at Mr. X's farm, he would expect that animal to be visited by a Veterinary Officer with the least possible delay, and I did not see how that could be done as the officers were totally ignorant of the country. The maps were granted.

The chapter on France and Belgium traces out for us the gradual expansion of the Veterinary Service which took the field in 1914 for the care of 53,000 animals, to that which became necessary for 450,000. The veterinary personnel rose from 122 officers and 797 other ranks in 1914, to 651 officers and 15,000 other ranks. The structure of the original scheme remained, but shorn of its errors, and to it new features were added acquired by experience.

The evacuation of the sick from the fighting line to the line of communication had been the problem to which attention and thought had been given in peace, and on which, when we took the Field in 1914, the reputation of our service largely depended. It had at last been recognised that fighting units cannot be encumbered with their sick, and that the A.V.C. must take them over and get them to the line of communication for treatment. The personnel allowed for this was small, but it was at least a useful nucleus. In the account given of the Retreat from Mons, we come face to face with the difficulties of putting this into practice with an enemy at one's heels. Railhead was sought, but at such a crisis the position of railhead depends on military conditions, which may be changing almost from moment to moment. Railhead may exist at a certain place at 10 a.m., but be miles to the rear by the time the party arrives with its convoy. It is fortunate, indeed, that the mobile sections did not encounter the enemy. At p. 649 we have a brief

account of what befell a small party of the enemy which encountered a mobile veterinary section. The experience gained there led to firearms being issued to all ranks, which had previously not been considered necessary.

That which may fail during the confusion of a retreat may do yeoman service under more favourable conditions and this proved to be the case; by rail, road and canal the sick were evacuated, and not only that, but replacements brought back for the depleted units. It was evident, from causes which this History relates, that there was a missing link in the chain of evacuation, and this was furnished by General Moore's "Veterinary Evacuating Stations," of which an account is given; subsequently, under other designations, these were adopted in the various seats of war. The organisation of "sick horse halts" (better, "veterinary rest camps") was a great improvement, suitable cases being travelled to the rear by short stages and unfrequented roads, men and horses resting for the night and proceeding the following day. Such organisations cannot run themselves; everything has to be thought out, provisions for men and horses to be ready on the spot, facilities for watering and for cover; time tables arranged to prevent congestion, and other details which give ample scope for the exercise of veterinary staff duties. It says well for the Regular Officer, who was largely denied this experience in peace, that his general training and resourcefulness rendered him most adaptable. On the other hand, the Administrative Veterinary Officers of New and Territorial Divisions had, of course, everything to learn.

It is interesting to observe the increases which had to be made in hospital accommodation as the strength of the army was added to, and the authorities at last brought to realise the animal casualties of war. Before the war the hospital provision for the Expeditionary Force of 53,000 animals had been fixed at six hospitals, each containing 250 patients, or a total of 1,500 sick. This took the Field in August, 1914; by November each hospital had to be enlarged to deal with 1,000 sick, and a year later the sick for each hospital was fixed at 1,250. By January, 1917, high water mark was reached, each hospital being arranged for 2,000 sick. The Editors of the History suggest that the War casualties were under estimated (p. 71) and that much trouble would have been spared had the expansion of hospitals been foreseen (p. 95). As a matter of fact, the war casualties had not been underestimated by those who were responsible for possessing the knowledge and advising the authorities. It is obvious that a knowledge of prospective losses is a subject of paramount importance, and for years data had been collected by me and published in order to draw attention to the matter.* All this evidence had been specially placed before the authorities five years before 1914, but there would appear to have been a reluctance to admit the necessity of large provision being made, and there were some, I fear, who regarded the remedy as too costly and that "shooting the lot" was the cheapest method of disposal. It is difficult to convince a mind untrained in such technical matters, especially as so much of our staff work lies in the hands of Infantry officers, who, with the best intentions in the world, are hopeless in dealing with such questions unless they have had some previous experience to guide them.

In 1909 the horses of one Division were mobilised for twenty-four hours as an experimental measure. I had the casualties carefully recorded, they amounted for one day and night to 1.7 per cent. of the strength, mainly from injuries. On 1st December, 1909, I wrote as follows to the authorities:—

"We can never have a lower sick rate on service than 12 per cent. of serious cases, and for these provision should be made. In six Divisions and a Cavalry Division there will be between eight and nine thousand sick horses. Arrangements exist for the care of 1,500."

In the paper on animal losses in war, quoted above as published in 1893, the sick rate was placed at 12 per cent; in France in 1915, hospital provision was asked for 10 per cent. of the force and in 1917 this was exceeded. There would have been no trouble regarding expansion had the sick rate put forward by the veterinary service in 1909 received the attention the subject demanded.

The chapter on France and Belgium gives us two light sketches of the veterinary service during mobile warfare; curiously enough they are the first and last acts of the drama, *i.e.*, the advance and retreat from Mons, and the advance into Germany. The former has already been hinted at; the latter gives an interesting account of the veterinary arrangements at Cologne, and of the co-operation of the German Veterinary Authorities in the suppression of diseases, for influenza, glanders and mange were rife in the enemy forces, and among the animals of the civil population. Practically in every seat of war the veterinary service found itself engaged in helping the civil authorities in their difficulties, and in the case of Mesopotamia even dispensaries were opened for the veterinary care of civilian animals.

The veterinary hospitals in France were a revelation, they showed what could be done by the veterinary service when given a free hand. Among the officers, experts arose in all directions and were encouraged in every way. The liberal financial aid of the Royal Society for the Prevention of Cruelty to Animals enabled a state of perfection to be reached, which astonished all who expected to find a veterinary hospital a focus of infection and a mere collection of neglected derelicts. These hospitals fixed the idea standard for Europe. In the East, as we shall see, the same general principles were obtained, though local conditions necessitated modifications.

Let us briefly state these general principles, which held good in all seats of war:—The sick and wounded were collected by Mobile Veterinary Sections, handed

* "The Loss of Horses in War"—*United Service Magazine*, 1893.
"The Loss of Horses in War"—*Journal of the Royal United Service Institution*, 1894.

over to Veterinary Evacuating Stations and despatched to the Line of Communications. On their reception in hospital they were sorted into medical, surgical, contagious, &c., tested with mallein and placed under treatment. When cured, they were transferred to Veterinary Convalescent Depôts, where they were built up and conditioned. After a final testing with mallein they were handed over to the Remount Service fit for immediate issue to the troops.

No other army in the world has such a perfect organisation; it has been built up step by step by the veterinary service and not always without opposition.

There is only one criticism we would offer in the matter of hospital construction, and are glad to see it anticipated on p. 94. We appreciate cover for the sick, but have a far greater appreciation for sound standings; if one had to choose between cover and bad standings and no cover with good standings, there is no question which should be adopted. For the horse in health we are out of sympathy with the constant craving for cover, irrespective of whether it is sanitary or suitable. If a war should again become static we ought to devote labour and material to give the horses a solid standing where they can be fed and properly looked after. No element but mud fouled by excreta hurts a horse in health, for then his food is wasted, his feet and limbs become diseased, and men cannot look after animals when they have to wade through a sea of putrid jelly.

It is pleasant to read of the harmonious working of the Home and Overseas Veterinary Services, and of the mutual interchange of ideas. We are glad also to see the recognition accorded the N.C.O.'s and men of the Corps for the good services they rendered, both in the actual construction of hospitals as well as in the care of the sick and convalescent. Those men familiar with animals in civil life were drafted into hospitals and convalescent depôts. The officers were able to show their appreciation of the valuable help by the great attention they paid to the comfort and well-being of their men. It was the spirit these men exhibited which proved so valuable. In Egypt they took as much pride in the camel hospitals and convalescent depôts as if they were looking after animals they had been familiar with all their life, and in this connection it must be remembered that the camel is not a lovable creature.

It is not permissible to close this notice without expressing to Major-General Sir John Moore, and the officers who served under him, the appreciation we all must feel at the outstanding successes secured by the Army Veterinary Service in France and Belgium.

PERSONAL.

Marriage: TOWNSEND—NORMAN. On October 1st., at St. Andrews, Cambridge, Major Charles William Townsend R.A.V.C. (T)., F.R.C.V.S., eldest son of Mr. and Mrs. J. J. Townsend of Hunstanton, Norfolk, to May Norman, only daughter of Mr. and Mrs. C. Norman, of Lolworth, Cambs.

ABSTRACTS.

(The use of Potassium Permanganate in the Drinking Water for Poultry. By SIVERT ERIKSEN, Pathologist, Missouri State Poultry Experiment Station, Mountain Grove, Missouri. *Journal of A. V.M. A.*, July, 1925. Vol. LXVII).

A series of experiments was carried out to decide the questions: How long potassium permanganate is effective after being put in drinking water; how $KMnO_4$ compares with other drugs in antiseptic value; if the constant use of $KMnO_4$ is harmful to fowls; if $KMnO_4$ can be used in water when sour milk is fed, without injurious results.

The method of procedure for the first series of experiments was to put dilutions of the salt varying from 1:2,000 to 1:10,000 in glazed-crock containers placed in a pen of twenty-five half grown chicks. Samples were collected by means of sterile pipettes at intervals of twenty minutes, four, six, twenty-four and forty-eight hours and their bacterial content estimated by plating. Thirteen trials were made and thirty-five samples cultured. Unmedicated water kept under identical conditions was used as a control.

This experiment showed that $KMnO_4$ is a very efficient purifier of drinking water for poultry. A dilution of 1:6,000 prevents the growth of bacteria in open vessels for forty-eight hours, if the water is kept free from excessive contamination of organic material. Samples contaminated by straw food or fæces soon lost the purple colour and a rise in bacterial count immediately followed. This colour change on loss of potency is of value in the employment of $KMnO_4$ for this purpose.

In the second series of experiments a similar technique was employed and the action of $KMnO_4$ compared to a number of other antiseptics. It was found to compare favourably with the reagents tried, all samples developed heavy bacterial growths when contaminated with litter. To test the possible harmful effect of the continued use of $KMnO_4$ on the birds themselves, twenty white Leghorn chicks, three weeks' of age were offered a 1:2,000 solution (a teaspoonful of $KMnO_4$ per gallon) and the treatment continued for nine weeks. At the end of this time only one chick had died and all the others had developed in a normal manner. Young chicks were used as being particularly susceptible to adverse conditions, and the author concludes that $KMnO_4$, even in much stronger solutions than necessary for water purification, is harmless to poultry.

The physiological compatibility of $KMnO_4$ with sour milk was tested because of the belief prevalent among poultrymen that $KMnO_4$ produces a poisonous substance when fed in connection with sour milk. The experiment was carried out with mature hens; sour milk and a ·2 per cent. solution of $KMnO_4$ in equal amounts were introduced directly into the coop. Similar amounts were also introduced after being mixed and allowed to stand one hour. No ill effects of any kind were noted.

The action of these substances was also tested on young growing chicks with no untoward results.—R. L. C.

(The possible transmission of Fatal Typhoid through the Egg).

In a preliminary report issued by the Department of Poultry Husbandry, New Jersey Agricultural Experimental Stations, (published in the *Journal of the American Veterinary Medical Association*), Beaudette points out, that since it has been shown that bacillary white diarrhœa is transmitted through the egg, the possibility of other infections being similarly transmitted seems to be quite within reason. During the past year the author has isolated what appears to be the fowl typhoid organism from young chicks on several occasions. This organism was also isolated from the unabsorbed yolk of a young chick, and in another instance from the ovary of an adult hen. This fact forms a parallel to that found in bacillary white diarrhœa. In order to complete the cycle of infection, the author points out it is necessary to isolate the organism from the yolk of eggs produced by infected hens. In March, 1925, an experiment was conducted with a view to identifying the infection present in a flock in which an ovary infected with the typhoid organism had been found. Sixty-six samples of blood were obtained from this flock and agglutination tests were made using both a white diarrhœa and a fowl typhoid organism, and dilutions of 1:80 for the white diarrhœa antigen and 1:40 for the fowl typhoid antigen were used. It was found that out of the sixty-six tests made, nine agglutinated, both the *B. pullorum* and *B. sanguinarium* antigens. The experiment was carried further in order to ascertain the titre limit for these antigens. Progressive dilutions were made from 1:40 to 1:1,280. After incubating for twenty-four hours the readings were almost identical whether a *B. pullorum* or a *B. sanguinarium* antigen is used. In those instances where a difference existed, it was always in favour of the *B. pullorum* antigen. The results of this experiment indicate that the organisms are so closely related serologically that the ordinary agglutination test is not sufficient to differentiate between them. At the present time an endeavour is being made to locate the parent stock of chicks from which fowl typhoid cultures have been isolated.—W. L. S.

The Council of the Royal College of Veterinary Surgeons have awarded a Walley Memorial Scholarship to Mr. Harold Burrow, a student at the Royal (Dick) Veterinary College, Edinburgh. The scholarship, which is awarded annually to the student at any of the veterinary colleges in Great Britain and Ireland who obtains the highest percentage of marks in the third professional examination for the diploma of M.R.C.V.S., was founded in memory of Thomas Walley, who for 20 years was Principal of the Edinburgh Veterinary College.

DIVISIONAL REPORTS.

Derbyshire Division.*

MEETING AT DERBY.

A meeting of the above Division was held at the Royal Hotel, Derby, on Tuesday, July 14th, 1925. The President, Mr. F. T. Prince, occupied the chair, and there were also present Messrs. W. F. Aston, W. T. S. Atkinson, H. Briggs, A. Levie, E. Marrison, and the Hon. Secretary (Captain O. V. Gunning).

The Scale of Fees for part time Veterinary Inspectors recommended by the committee appointed by the N.V.M.A. was considered, and it was felt that the scale, with very few exceptions, corresponded closely with those paid in the Derbyshire area.

A letter was read from Mr. Bullock, regarding the Garnett Memorial Fund, and it was unanimously decided that a donation be sent.

A letter was read from the General Secretary N.V.M.A., regarding representation on Standing Committees. It was pointed out that the President and Secretary were the standing representatives of the Division. The President said it was most difficult for him to attend, and he deputed Mr. Aston to represent him.

THE SEX GLANDS.

Mr. LEVIE, in opening the discussion on Mr. Aston's paper, said: We are under an obligation to Mr. Aston for his valuable contribution on the Sex Glands. From an educational viewpoint it is helpful, but from a practical viewpoint it does not appear to contain information which will enable the practitioner to utilise it on his own or his clients' behalf. I do not say this in any critical spirit, for I hope Mr. Aston has reserved this aspect for part of his resply to the discussion. It would be helpful if Mr. Aston would more fully explain how the practitioner to some extent controls the destinies of such natural malformations. I agree it would be an advantage to us, as a body, had members contributed outstanding information on the subject, but the uphill fight the Veterinary Profession has had to attain its rightful place in the scientific world chiefly through lack of funds and poor Government recognition is, I think, the explanation.

Would Mr. Aston explain the action of the secretions of the uterus and mammary glands on the ovaries? I should have thought the reverse was the case. It would be helpful to members if Mr. Aston would more fully explain the hormonic influence of the testes and ovary in the formation of sex and more so if he would explain the determining course of an impregnated ovum producing a male or female. Mr. Aston has assumed two sexes as opposite as the poles. May I suggest they have much in common, and in this I am supported by his own evidence that transition between male and female types occurs.

*Received on October 3rd.

I agree with all Mr. Aston has said about removal of the testes, but I question his remarks on the pituitary, thymus, etc., affecting the character of the animal. Is it not rest to mind and body which is largely responsible for the changes which occur?

The influence of the corpus luteum (the residue of the Graffian vesicle) on pregnancy has been long recognised and it is of interest to all of us to have the matter so concisely brought to our knowledge.

The grafting of the male in the female and *vice versa*, produces conditions as stated; they are points of interest, but of no commercial value. When both are planted in a gelding the results must be interesting and at times amusing.

Mr. MARRISON thanked Mr. Aston for his very valuable paper, and stated that it had to be studied very deeply.

The PRESIDENT, in thanking Mr. Aston for his paper, said he had hoped to hear more about sterility; he thought the paper was rather out of their depth.

The HON. SECRETARY said Mr. Aston had introduced somewhat of a new subject to them. They, as practitioners, were perhaps inclined to under estimate the importance of the actions of the ovaries and testicles. A thorough understanding of the sex glands in health was, of course, essential to an understanding of the sex glands in disease and, with regard to sterility, one might feel fairly at home in the uterus, but when one got higher up to the oviducts and ovaries it was surprising how limited our knowledge was on the subject. He would like to ask Mr. Aston to explain the reason for the male voice frequently found in nymphomanic cows, and also if he could tell him the reason for the small cysts which so frequently occurred on ovaries of apparently normal animals.

Mr. ASTON'S REPLY.

Mr. Aston, in reply to Mr. Levie, reminded him that before one can consider disease one must be conversant with health and it was as an educational paper for the busy practitioner that he had dealt with the subject in that way before describing any means of controlling the diseases which arise in the genital organs. He agreed with Mr. Levie that the stinting of money had greatly hindered the veterinary research of this country, but a greater hindrance was the lack of co-operation which, until the last few years at least, had existed between the so-called research workers and the clinician. One of these research workers remarked to him that "clinical knowledge is of practically no value to research" and it was due, to a great extent, to such a terrible error of judgment that they had not done the amount that they might have done.

It was believed that the determining factor in deciding sex was a biochemical agency and that it was in existence a fortnight after fertilisation in the cow—how much before they did not know.

He had not assumed two sexes as opposite as the poles—he suggested all through that there was a common type and that male and female characters developed from it; that many of the so-called sex characters would be found to belong to that common type and it was erroneous to describe them as definite male or female characteristics.

With regard to Mr. Gunnings' question of the male voice in nymphomanic cows, he would suggest that this so-called male voice really belonged to the common or asexual sexual type, and they were in error in calling it male.

He was unable to give a definite explanation of the small cysts normally present on cows' ovaries—they certainly were very general and did not appear to cause any harm.

O. V. GUNNING, *Hon. Secretary.*

South Eastern Division.*

VISIT TO RHODES FARM.

An ordinary general meeting of the Division was held at the Field Laboratories of the Medical Research Council at Rhodes Farm, Mill Hill, N.W.7, on Wednesday, 22nd July.

The chair was occupied by the President, Captain F. C. Gillard, M.C. and there were also present Majors G. W. Dunkin, C. Rose and L. Lyne Dixson, Professor Wooldridge, A. Spicer (F.), T. F. Hogben, W. Cattell, W. W. Gulleford, A. T. Crowther, F. Marks, J. B. Dier, F. Crowhurst, G. Walker, P. Perrin, J. W. N. Hinton, J. Bell (F.), and the Secretary.

Visitors included Captain S. R. Douglas, F.R.S., Chairman of the Tuberculin Committee and Director of the Pathology Department of the Institute, Major P. J. Simpson, D.S.O., F.R.C.V.S., R. Edwards, E. Edmondson and J. Pickup. Letters of regret at inability to attend were received from Professor Buxton, W. Coveney, E. Morgan, F. F. Horton, A. Whicher, W. Andrew and C. Crowhurst.

In order that the arrangements which had been made by Major Dunkin should not be upset and that the time table arranged by him should not be interfered with, the President suggested that the demonstration of the intradermal tuberculin test should be the first business dealt with and that the ordinary business of the meeting be left until the end of the afternoon. This procedure was agreed to and at the outset the president announced that amongst their visitors there was one whom they were particularly pleased to see, namely Captain S. R. Douglas, F.R.S. Captain Douglas was Chairman of the Tuberculin Committee, which had been responsible for the work concerning the result of which they had met that afternoon. The President then called upon Major Dunkin to speak.

Major DUNKIN then gave in detail the general technique of the test and explained very thoroughly each step in the process. Particular stress was laid on the question of visits and it was stated that at least three, and at the most not more than four, visits were necessary, and not five as had been erroneously stated by the reviewer of the report in the July issue

* Received on October 5th.

of the *Journal of Comparative Pathology and Therapeutics.*

The interpretation of results was next dealt with and these remarks were all the more interesting in so far as cattle had been tested, both re-actors and non-reactors, for the inspection of the members.

The detailed description of the test has already been published in the *Veterinary Record*, following on the visit of Professor Buxton to Perth, and to recount Major Dunkin's remarks in detail would only be a repetition of this paper.

Captain DOUGLAS, on being asked by the President to speak, commenced by saying that the original idea that the Committee should adopt the double intradermal test and that the site should be the neck really emanated from Professor Buxton. Continuing, he said that veterinary surgeons who had practised the test and whom he had met had reported favourably.

He thought it must be a great boon to owners of cattle and a blessing to the veterinary surgeon that no night visits were necessary and the cattle undergoing the test need not be kept in the sheds.

The injections were easily carried out and he had not met a practitioner who had had any difficulty in their execution. The main items to observe were that the injection should be as deeply placed as possible in the derma and that a reliable concentrated tuberculin be used.

Both Captain Douglas and Major Dunkin replied to the many questions put to them by the members and the meeting then adjourned fo the farm buildings to inspect the cattle which had been tested. There were cows, heifers and calves—in all thirteen beasts. Both re-actors and non-reactors were shown, in order that members might be able to observe the difference in the type of swelling resulting from an injection of tuberculin into each of these two classes of animal. Several injections were carried out and the members were invited to inject for themselves.

Major DUNKIN stated that all beasts there which were shown that day had had the first injection only and that this had been received two days previously. At this stage it was possible in certain cases to detect re-actors and in such cases it was therefore unnecessary to give the second injection. In all other cases, *i.e.*, doubtful cases and apparent non-reactors, it was, of course, necessary. At the conclusion of the demonstration the members were kindly entertained by Major and Mrs. Dunkin to tea, which pleasantly ended the first part of one of the most agreeable meetings held by the Association.

OTHER BUSINESS.

Membership.—Election of Mr. A. Spicer, F.R.C.V.S., and nomination of Mr. A. Edwards.

Council of N. V.M. A.—Major G. W. Dunkin was re-elected representative, with the Hon. Secretary.

Victoria Veterinary Benevolent Association.—Professor J. B. Buxton was re-elected representative of the Association and the usual subscription of £2 2s. 0d. was authorised to be paid.

(Continued at foot of next column.)

Recent Regulations in Food Inspection.

DISCUSSION ON MR. MCALLAN'S PAPER.

(*Continued from page* 878).

METHOD OF DEALING WITH BLOOD FROM ANIMALS SLAUGHTERED AT THE METROPOLITAN ABATTOIR, ISLINGTON.

Mr. HAYHURST, proceeding, said: In this category it is essential to bear in mind the ultimate use to which blood from slaughtered animals is to be put; also the method employed in slaughtering animals intended for the food of different members of the community must be considered.

The blood of animals slaughtered at the Metropolitan Cattle Market is used for three purposes:—

(*a*) For human consumption.

(*b*) Manurial purposes (fertilisers, blood manure, etc.).

(*c*) Manufacturing purposes (woodwork).

In the case of blood intended for human consumption it is essential to know that the blood has been obtained from an animal that has been certified as being free from disease. In the ordinary way this is a difficult matter, the animal having been bled as a preliminary to the dressing of the carcass, and a subsequent examination of the carcass, offal, etc., by the inspector. At the present time blood for human consumption and research purposes is only collected from steers, heifers and bulls, all cow blood being rejected. The blood is taken from animals which have been slaughtered with the pole-axe or mechanical killer and bled directly into a suitable receptacle (galvanised shallow pan). This obviates the blood being contaminated after leaving the animal; two of these shallow tins usually hold the entire blood from one beast The two tinfuls of blood are now put into a perfectly clean galvanised bucket and stirred. The bucket used is one of a series numbered from one to six. By numbering the buckets in this manner it is possible to tell from which animal the blood was obtained, similar numbers being attached to the carcasses. These buckets have a white gauze covering put over them, and are placed on the side of the cooling chamber.

By the time three or four buckets of blood have been put in the cooling chambers (numbered 1—4) the completion of the dressing of the carcass from which No. 1 blood was obtained has been completed, and the meat inspector is in a position to make his examination of all the offal pertaining to the carcass,

(Continued from previous column.)

The claims of the National Veterinary Benevolent and Mutual Defence Association were advocated by the PRESIDENT, supported by the SECRETARY, and membership commended to all the members.

The next meeting of the Division is to be arranged for at a suitable date at the Laboratory of the Ministry of Agriculture and Fisheries.

HUGH P. HOGBEN, *Hon. Secretary.*

and the carcass itself. If any diseased condition should be found in the offal or carcass the blood in No. 1 bucket is considered unfit for human food and destroyed. The contents from four to five buckets of healthy blood are usually transferred to a perfectly clean (scalded) milk churn, and in this conveyed to any food factory which is using large quantities of blood. In the case of people only requiring say a quart of blood, the blood is put into a perfectly clean galvanised tin. Any one requiring blood for human consumption or hospital investigation must bring an order duly signed by a responsible person stating for what purpose the blood is required; this serves as a pass to obtain admission to the abattoir. It is necessary for these passes to be signed by the meat inspector on duty, his signature signifying the fact that the blood is fit for human consumption and is also contained in a clean receptacle. These passes are given up to the constable on duty at the gate, and no blood is allowed to leave the abattoir unless so certified.

Blood and serum intended for human consumption from horses slaughtered at Islington is dealt with in precisely the same way as cattle, horses being bled in the same way as pole-axed cattle.

In the case of pigs and sheep the blood intended for human consumption is collected in the same way, a small cupped shaped vessel being used instead of buckets, etc.

Blood from animals intended for manurial purposes (fertiliser, blood manure, etc.), and also manufacturing purposes, is composed of all blood other than that which can be certified as fit for human consumption. It is obtained from cattle, sheep, pigs and horses, and from all animals slaughtered by the Jewish method, and by that employed by the Mohammedans; it being impossible in the case of animals slaughtered by these methods to collect blood that has not become contaminated with manure, water, etc.

It is collected in the following manner: Special large barrels, painted red to distinguish them from all other receptacles used in the collection of blood (for human consumption) are placed adjacent to the slaughterhouses. When these barrels are full a small amount of crude carbolic acid is mixed with the contents. This is done to make the use of this class of blood for human purposes impossible. The barrels are then closed up and removed from the abattoir on the same day that the blood is collected. A pass, stating the nature of the contents of the barrels and duly certified by the meat inspector, has to be given up to the market constable on duty at the gate on the consignment leaving the abattoir.

Mr. Dolan (Dublin) said that in the Irish Free State under the new Local Government Act, 1925, it was laid down that in each sanitary authority one of the sanitary officers shall be a veterinary surgeon. This was put into the Act through the working of the Veterinary Medical Association of Ireland. (Applause.) That was a great step in the right direction. The veterinary profession disliked the words sanitary officer, but they must remember that the Medical Officer of Health was also a sanitary officer. What was required was that all sanitary authorities should recognise the veterinary surgeon as a sanitary officer by reason of his qualifications. Alluding to glass windows in shops, Mr. Dolan asked was this not an economic question as well as a public health question? Was it not true that those victuallers who had put in windows had been repaid in a very short time by the better keeping qualities of the meat? In the Public Health Meat Regulations, Scotland, 1924, the term carcass lymph gland, he thought, was used somewhat loosely. If a tubercular lesion or an abscess was found in any carcass lymph gland, all the other carcass lymph glands shall be examined. What was a carcass lymph gland as meant by these Regulations? Were all the lymph glands that were in or attached to the carcass after removal of the viscera carcass lymph glands? The true carcass lymph glands in cattle were the prescapular, axillary, flank, precrural, ischiatic, and popliteal. It would be a serious thing to confine their examination to these glands only. On the other hand, was it necessary to examine in all cases the popliteals when, say, the lesion was in the suprasternal? It was important for the purposes of meat inspection that the meat inspector should keep in front of him the three classes of lymph glands—the true carcass, the carcass and visceral, and the visceral only.

Mr. Hugh Begg (Lanark) said that with regard to Scotland, the local authority might appoint a sanitary officer to the work of meat inspection. Scotland was not quite so far advanced as Col. Dunlop Young's statement seemed to show.

Mr. Elmes (St. Albans) thought they had not been sufficiently interested in meat inspection in their profession. When the Tuberculosis Order was being discussed in Parliament, members of Parliament asked questions as to what was going to become of the meat. It was said that meat condemned might be eaten, and it gave them a fright. There was no one to speak on behalf of the profession, to say that all this meat would be inspected by a capable and efficient veterinary surgeon, and the result was another Order from the Ministry saying that if any animal was killed under the Tuberculosis Order the veterinary inspector who was carrying out the work would have to give notice to the Medical Officer of Health who should come and give his opinion whether the meat was fit for human consumption or not. Throughout the country generally there was nothing known about it. They, as a profession, were not recognised, and the public did not recognise that they were capable and efficient and would work heartily with the local authorities for the preservation of public health.

Mr. Gooch (Stamford Baron) thought the first clause on page 16 was a practical part which should come out of that Conference. He thought one of the most important clauses was on page 170. They had the Regulation which made it necessary for every animal brought into any slaughterhouse *in extremis* to be at once reported to the veterinary officer in

charge. With regard to tact, he thought that was one of the greatest words that had been used in the discussion that morning. If they set themselves against the trade, the trade would go against them, but if they worked in harmony with the trade, the trade was willing to carry out those Regulations—those in a respectable position in the trade. They had been complaining for a long time that they had been cut off, and one of the most difficult positions they had to occupy in the large cities and boroughs was working with the men in the rural districts. He thought that was one of the most difficult positions in working the Act of 1925. He had not heard in rural districts of a veterinary surgeon or even a competent officer to carry out these meat regulations; it was nearly always a sanitary officer, and not a properly qualified sanitary officer. One of the chief drawbacks in his borough was the private slaughterhouses for pigs, and he made it compulsory that he should have notification at least three hours before slaughter, and they were now all inspected before slaughter. Immediately he was appointed inspector he asked the Council to allow him to call a meeting of the butchers and slaughterhouse owners, and they had a meeting, and after explaining the differences that would take place in the regulations, he said he had been appointed to carry out the duties of inspector, and he was going to carry them out, and if they were willing to assist him they could work harmoniously together. He was very pleased to say that every one of the butchers was working as harmoniously and carrying things out as far as possible, although it meant a great deal of expense to them.

Mr. WHITEHEAD said it appeared to him that the regulations meant that in a few years there would be no lay meat inspectors in Scotland, because of the seven years' qualification. Evidently, in course of time, there would be none but veterinary surgeons working as meat inspectors in Scotland, and the laymen would be purely detention officers. It was a matter of regret to him that the Ministry had not been able to follow the Scottish lead for England. With regard to the qualifications of Medical Officers of Health and the necessity of having a D.P.H. before they could be appointed medical officers in towns of a certain size, Mr. Whitehead said the Diploma in Public Health was no guarantee of knowledge of meat inspection. He was speaking to a medical officer only a month ago who told him he had the Diploma of Public Health, but knew nothing about meat inspection and never was taught it. He (Mr. Whitehead) thought the Ministry of Health must improve on the Diploma of Public Health by making it necessary to know something about meat inspection.

Colonel DUNLOP YOUNG: The department are doing so.

Mr. WHITEHEAD said there had come to his knowledge a recently-published book. He had no interest in it. It was published by the Sanitary Publishing Company, and was on the Public Health Meat Regulations, 1924. It was the best book he had met with on the law of meat inspection. The price was 12s. 6d.

Mr. WILLIAMS (Swansea) said that if he had to choose a text he would take, "Behold, the mountain was in labour and it brought forth a mouse." He had lived to see the day when the mountain had come through its troubles and produced a mouse. Attention had been called by Colonel Dunlop Young to the fact that a good deal depended upon themselves as to what they got. It was with diffidence that he spoke on this subject because he had to speak about himself. When he was appointed he was a part-time inspector and was ignorant of the law of meat inspection; but soon after his appointment he discovered that he could not conveniently carry on his duties under the Act under which he was appointed. So he went to the Town Clerk and suggested that in the next Omnibus Bill the Corporation promoted in Parliament they should include a clause to give the veterinary inspector the same powers under the Public Health Act as the Medical Officer of Health and sanitary inspector. In due course they had to go to London, and appeared before the Committee of the House of Commons. He was asked on what grounds he wanted the power. He explained. There was no question about it. The head of the Committee told him he had no objection. That was nearly 25 years ago, 23½ as a matter of fact. If at that time an individual Corporation could go to Parliament and get this power, why was it that an Association like this had been so apathetic and had not got the same power? (Applause.) Local authorities could do a lot. His Corporation at the same time asked for power to prohibit the inflation of carcasses and it was granted; also they had a clause which referred to the transport of meat. Why was it that their Association was so long before it got these things passed? Replying to Mr. Gooch as to whether there was a rural district in England that had appointed a veterinary surgeon to carry out these duties, Mr. Williams said that he was the officer for the Corporation and for the Rural District as well, and had been appointed to carry out these duties. Replying to Mr. Whitehead, he did not see why part-time inspectors should not do the work. If they had any experience they would soon find out about the law on the subject. He had no criticism to offer with regard to the paper, but wanted to call attention to the point he had mentioned, about which he hoped to rouse the National Association to take action. (Applause.) There was no necessity for rushing. He would like to remind them of the words of Dr. Bradley in that room: "I would like to see this meeting proceed with all convenient speed, but when we do so to proceed with dignity." Surely the National Association, with a strong backing, had power to get what they asked if those things he had mentioned were granted 25 years ago.

Councillor HARVEY thought the profession should be fully alive to its future. They were passing through an evolutionary stage, and they were just a little bit behind. Their recognition as a separate

service uninterfered with by any other branch of the Public Health Service was assured. The developments of the veterinary services in the near future were bound to be immense. They were going on developing, and he had not the slightest doubt that they were within measureable distance of the time when, without any undue pressure on their part they would realise their ambitions as a separate service. It must be accepted even by the Medical Officer of Health, whose duties during the last quarter of a century had been becoming more and more administrative. The Children's Care Act, the Venereal Diseases Act, the treatment of tuberculosis, had all resulted in the appointment of specialised officers, particularly with large authorities. Specialisation was the call which the nation, in its desire for efficiency, made to its general health services. We must specialise in everything. Personally he had no doubt that what was taking place with regard to larger authorities must ultimately take place with regard to all. They must have specialisation. The question was: "Can smaller authorities afford to have whole-time officers?" and the answer was "No," but they had an analogy in the case of venereal disease; where authorities could not afford to have an entire scheme of their own they became part of the scheme, and a larger adjacent authority. That was working very well all over the country, and the smaller authorities had recogised and accepted their responsibility by joining the larger authorities' schemes. He would much prefer that there should be full-time veterinary officers; but where these could not be appointed there should be something analogous to what had happened in the venereal disease schemes, and the smaller local authorities ought to be permitted to join with the larger authorities, they themselves appointing part-time veterinary officers under the supervision of the principal inspectors of larger authorities. That was a proposal he hoped to make with regard to his own area. He thought that was a solution of the question, and he was satisfied that it was a proper solution. He thanked Mr. McAllan for his paper, which he had read four times, and Colonel Dunlop Young for his very enlightening opening.

Colonel DUNLOP YOUNG said it was a great pleasure to have with them Judge Harvey, and hear the encouraging remarks that had fallen from his lips. They had been fighting a long, uphill battle and it was encouraging to know that they had pushed the trenches in and were going on to victory. He would like to emphasise the word "tact." They were a little to blame in trying to shout that they and they only should be responsible for the inspection of meat. In justice to the medical officer he would point out that meat is food of the human being, and the medical officer was responsible for the human being, and should have the last word as to what the human being was going to have. If they adopted that attitude, and the medical profession knew that they adopted it they would gain their own end. The medical officer should say what was fit or unfit for human food, and the veterinarians with their special knowledge of animals, should condemn according to what they thought was fit or unfit. In the scheme the veterinary officer would be in charge of meat inspection. Colonel Young then proceeded to move the following resolution: "That the National Veterinary Medical Association is of opinion that energetic action should be taken to have inserted in the first Public Health Act a clause giving effect to the recommendation of the Departmental Committee with reference to the power of the veterinary officer."

Mr. MCALLAN seconded. He agreed with Colonel Dunlop Young as to the part laymen could play in regard to meat inspection. With regard to Colonel Dunlop Young's remark about the English meat regulations being merely recommendations, he thought they were merely recommendations because there were so many public slaughterhouses, and it would make the working of the regulations practically impossible if they were anything more than mere recommendations. With regard to the question of stamping Aberdeen meat, he had to point out that no stamping could take place unless the trade wanted it. He had consulted the trade in Aberdeen and some thought it was desirable and some not. He would let them into a trade secret: all the meat killed in Aberdeen was not Aberdeen meat. They killed animals in Aberdeen which he personally would not like to put a stamp on as pure Aberdeenshire meat—("Shame")—because he would probably be doing Aberdeenshire meat more harm by doing so. As to the public health side, he entirely agreed with Colonel Dunlop Young's views. He was glad that Mr. Hayhurst emphasised the point that the whole purpose of meat inspection was to save as much meat as possible, and prevent too much condemnation, and he was very glad that he brought out the question of the possibilities of research which arose on meat inspection. He himself supplied a good deal of material for the slaughterhouses to the research workers in Aberdeen, and these workers realised that there was no place like a slaughterhouse for getting material for research work. He was very interested in Mr. Hayhurst's remarks about dealing with blood. To his mind, blood was dangerous only in case of septicæmic diseases such as anthrax. He saw tremendous difficulties, especially where they had private slaughterhouses, in retaining blood until inspection had taken place; but in public slaughterhouses he could see it would be quite easy to detain the blood until inspection had taken place; but with multiple slaughterhouses he saw too many difficulties to suggest any plan. Concerning Mr. Dolan's remarks, he did not agree that it was necessary that a veterinary officer should be a sanitary officer before he could deal with meat. He thought it was quite unnecessary to ask for that. With regard to the comment *re* carcass lymph glands, he gave in his paper a few examples, but all those examples were merely guides to the inspector, and chiefly perhaps to the untrained inspector. With reference to Mr. Begg's words, all he had to say

was that he was very sorry that Lanarkshire was in such a lamentable condition with regard to meat inspection. (Laughter.) It was an example to them in Scotland in many things, and it was time they were improving in their meat inspection. With regard to Mr. Whitehead's remarks about the Medical Officer of Health, he had not met a Medical Officer of Health yet who had professed to know much about meat inspection, and he did not think they would ever find him if they took their proper place when many of them now had the teaching of students who were going up for the D.P.H. course. Mr. Davis had emphasised the difficulty of getting various recommendations with regard to their status under the Public Health Acts. He thought the reason was that they had had no general Public Health Act on which the question could be brought up. With Mr. Harvey's views as to the duties of the Medical Officers of Health he entirely agreed, and his experience of them was that they looked upon themselves now as purely administrative, and the different officials who worked under them were merely feeders for them. He consulted them to know what was happening with regard to different things and expected to get the right information.

The motion was then put and carried unanimously.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest in these columns

Diary of Events.

Oct. 19th.—Opening Ceremony, Royal (Dick) Veterinary College, Edinburgh.
„ 20th.—Meeting of the Lancashire Division at Liverpool.
„ 23rd.—R.A.V.C. Old Comrades' Association Dinner.
Nov. 5th.—Annual Dinner of the Central Division.
„ 30th.—Notification of changes of address to Registrar, R.C.V.S.
Dec. 1st.—R.C.V.S., Examination Fees (December Exams.) payable.
„ 8th.—R.C.V.S., Written Examination.
„ 10th.—R.C.V.S., Oral Examinations commence.

Mr. Frederick Knight, late Assistant Secretary to to the Royal College of Veterinary Surgeons, has been appointed General Secretary to the Association. We offer to Mr. Knight our sincere congratulations.

Our readers will learn with great regret that after attending the cremation at Hull of the remains of her late husband, a veterinary surgeon, Mrs. Walter Longhurst retired to her room, collapsed and died.

A resolution that the National Federation of Meat Traders' Association bring all possible pressure to bear on the Government to ensure that all cows rejected from herds on account of tuberculosis shall be slaughtered under Government supervision and not be offered for sale, was passed at the Association conference at Birmingham.

Royal College of Veterinary Surgeons.

Obituary.

Forster, S. S., Capt. R.A.V.C. (T.A.), Croft House, Brackley, Northants. Graduated Edinburgh, May 22, 1897. Died at Brackley, 4th October, 1925.

Frank Garnett Memorial Fund.

Eleventh List of Subscriptions.

	£	s.	d.	£	s.	d.
Amount brought forward from tenth list ...				368	10	0
H. G. Bowes	1	1	0			
J. A. Edwards...	1	1	0			
Miss Mokant	1	1	0			
Miss Grafton	10	0	0			
J. Anderson		10	6			
W. R. Wooldridge		10	6			
	14	4	0			
add Sir Stewart Stockman		5	0			
				14	9	0
				382	19	0

"Mr. Philip Deighton, of Millgate, Selby, on Saturday celebrated his 78h birthday," says *The Yorkshire Herald*, of September 29th. "He has been for 62 years a veterinary surgeon, and is still actively following up his business. Mr. Deighton is an authority on veterinary science, and has held the position of president of a Veterinary Medical Society.

"For some 30 years he belonged to the Yorkshire Hussars, and for years was farrier-quartermaster-sergeant of the East Riding Squadron. During the Great War he was employed by the Government in the purchase of horses for the Allied forces. For upward of 50 years he followed his profession on horseback and covered on an average 40 miles a day. He estimates that he rode almost a million miles attending animal ailments."

"The grave dangers of anthrax, and the general inability of farmers to distinguish the symptoms of the disease, were," says the *Yorkshire Post*, of October 2nd, "outlined at the Gateshead County Court yesterday, when John Edward Hunter, a Wylam farmer, was fined £10 for failing to notify a suspected case of anthrax, and for cutting the skin of an affected animal.

"It was stated that, when the animal became ill its throat was cut, and a butcher called in to save the flesh before the necessary notification was lodged with the authorities.

"For the defence it was stated that there were no outwardly discernible symptoms of anthrax about the beast—a cow—and the existence of the disease could not be seen save by one with expert veterinary knowledge.

"A veterinary surgeon giving evidence, said that a cut or abrasion on the hands of anyone handling the beast after the skin was cut would have meant, had the anthrax bacilli got into the blood, death within seven days. There was, he added, a general inability among farmers to recognise the disease. Scarcely one farmer out of twenty could tell it, or had had experience of it."

CORRESPONDENCE.

The Export of Horses for Butchery.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—By the courtesy of Professor Hobday, we, members of four different Humane Societies, joined the party that has just visited Holland, and we have to thank very cordially both our fellow-travellers and their Dutch friends for the welcome they gave us.

But we feel bound to explain that no one can judge "the existing conditions" of the traffic in butchery horses from what we saw on that visit. The weather was extraordinarily calm, so that all the horses arrived in good condition. We only saw them at the docks and in the quarantine stables. We were given no opportunity of seeing them taken from there to the markets and sold for slaughter, no one knows where or how. Also, though quite decrepit horses are not, to our knowledge, now passed for export, some of us have seen very old horses arrive, even in Holland. But this would not happen on days when the visit has been announced in the press, when photographers are at the docks, and directors of certain shipping companies travel with the horses in their boats, as was the case during this visit.

In any case, the traffic cannot be judged by conditions in Holland alone, since horses sent to Paris and Ghent are knocked on the head with a hammer, sometimes receiving several blows; sometimes their throats are cut before they are stunned. At Antwerp, and sometimes still at Rotterdam, they are killed with the poleaxe, and it has been admitted that "on many occasions where use has been made of the poleaxe, three, four, and sometimes five blows have been delivered to an agonised horse in an endeavour completely to stun him." Quite recently, a horse at Antwerp received four blows with the poleaxe before he fell.

To judge the conditions of the export of horses for butchery, visits must also be made after bad weather. The horses must be followed to the places where they are sold, and after that to the places where they are killed.

An expert at the Amsterdam Abattoir told us that horse meat is continually and satisfactorily chilled there. In answer to questions, he said that horse flesh killed in England, given time to cool, and chilled on the boats, would reach Holland in quite satisfactory condition. This is the only system which will end the cruelties inherent in the live traffic.—Yours faithfully,

(*Signed*) A. M. F. COLE,
Royal Society for the Prevention of Cruelty to Animals.
(*Signed*) W. R. LUMLEY HOLLAND,
National Council for the Abolition of the Decrepit Horse Traffic.
(*Signed*) W. A. S. GILES,
Our Dumb Friends League.
(*Signed*) VIOLET WOOD,
The Council of Justice to Animals.
Royal Society for the Prevention of Cruelty to Animals,
105 Jermyn Street, London, S.W. 1.
12*th October*, 1925.

"Professor Glaister's Statement."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In *The Veterinary Record* of the 26th ult. there appeared an article headed "Glasgow Veterinary College. Professor Glaister's Statement," in which the following occurred.

"Even in the last examination so conducted in July of this year, the students of the Glasgow College have come through the ordeals of examination most creditably. Of the 45 students from the College who presented themselves in all four examinations, 73 per cent. passed, and 27 per cent. failed to pass. Comparing these results with those of the other veterinary colleges the following is the result, *viz.*; London and Liverpool had a percentage pass of 64 and failures 36; Edinburgh a percentage pass of 66 and failures 34; Dublin 61 per cent. passes and 39 per cent. failures to pass; and the four schools combined (excepting Glasgow) shows 64 per cent. passes and 36 per cent. failures."

As these statements are likely to be highly detrimental to the interests of the Royal Veterinary College, I shall be glad if you will allow me the opportunity to state that they are absolutely misleading and, in their implication, exactly the reverse of the truth.

During the past twelve years (1913 to 1924), 1,436 students from the Royal Veterinary College were presented for examination, and of these 1,085, or 77 per cent. passed. During the same period 612 students were presented from the Glasgow College, and of these 413, or 67 per cent. passed. Only one other College had as large a proportion of rejections.

In case it should be supposed that the present efficiency of the Glasgow Veterinary College is concealed by combining the results of so many years, I think it well to give the figures for the last four complete years (1921 to 1924). During this period the percentage of passes in London was 77 per cent. and in Glasgow 70 per cent.

I assume that the Principal of the Glasgow Veterinary College supplied the figures used by Professor Glaister, and I think he owes it to your readers, and in fact to the public, to explain why he suppressed the facts which I have stated above.—Your obedient servant,

J. M'FADYEAN,
Royal Veterinary College,
Camden Town, N.W. 1.
13*th October*, 1925.

"The Whole-time Conscience."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I do not know whether I am the representative of a local authority to whom Mr. Hogben mysteriously refers in his letter in your last issue, but if so, I can assure him he need have no hesitation in referring to me by name.

I may be "stereotyped and affected by my environment," but I have at no time, and certainly not in the paper read by me in Edinburgh, accused or even suggested that the practitioners to be employed as part-time officials would be guilty of moral laxity. On the other hand, I have been able to see distinctly the administrative difficulties under which many veterinary surgeons employed as part-time inspectors carry on their work and I am satisfied that if Mr. Hogben prefers to carry on his work under the administrative control of the Chief of Police, he will not find many to agree with him, nor will the Veterinary Profession be permitted to take the position in the control of animal diseases which we believe should be ours.

I am not ashamed to repeat, what I have consistently advocated, that the best results can only be obtained by an active co-ordination of part-time officers administered by a whole-time veterinary officer nucleus.

It is, of course, always open to read into papers and statements something which is never intended, but surely although we unfortunate whole-time people may suffer from the disadvantages so kindly described, and which do not appear to affect our brethren in general practice, we might be given credit for opinion honestly expressed and without distortion.—Yours faithfully, J. W. BRITTLEBANK,
Veterinary and Milk Control Section,
Public Health Office,
Civic Buildings, 1 Mount Street, Manchester.
October 13*th*, 1925.

The Editor acknowledges the receipt of the following:—

Communications from Messrs. C. S. M. Hopkirk, and A. W. Noel Pillers.

Report of a meeting of the Lancashire Division, from Mr. J. Spruell, Hon. Secretary.

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE: 10 Gray's Inn Square, London W.C.1.

Cheques should be made payable and all communications sent to the General Secretary at the Offices of the Association, 10 Gray's Inn Square, London, W.C.1.

GENERAL ACCIDENT

FIRE AND LIFE

ASSURANCE CORPORATION LIMITED

PERTH, SCOTLAND & ALDWYCH, LONDON, W.C.2.

Pioneers for Live Stock Insurance.

Farm Horses.	Bloodstock.	Pedigree and Commercia Cattle.
In-foal Mares and Foals.	Hunters.	Marine Transit to all Parts.
Stallions.	Show Transit.	

LIBERAL TERMS to the VETERINARY PROFESSION

Works by Frederick Hobday,

C.M.G., F.R.C.V.S., F.R.S.E.

CASTRATION (including Cryptorchids and Caponing) AND OVARIOTOMY OF ALL ANIMALS. 2nd Edition. Price 7s. 6d.

Published by W. and A. K. Johnston, Easter Road, Edinburgh

SURGICAL DISEASES OF THE DOG & CAT. 3rd Edition. Price 15s. (postage 9d.).

ANÆSTHESIA OF ANIMALS AND BIRDS. Price 5s.

ATLAS OF ANATOMY & PHYSIOLOGY OF THE DOG (In conjunction with Harold Stainton, F.R.C.V.S.). Price 10s. 6d.

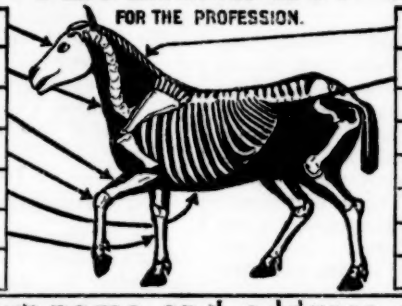
EDITOR OF COURTENAY'S VETERINARY MEDICINE. 3rd Edition. Price 12s.

EDITOR OF THE VETERINARY JOURNAL. Published Monthly. Subscription 21s. annually.

Published by Baillière, Tindall & Cox, Covent Garden London.

HUXLEY'S VETERINARY PRODUCTS

FOR THE PROFESSION.



OPHTHALMIC CAPSULES CATARRH CAPSULES	ABSORBENT ANTISEPTIC DUSTING POWDER
ANTISEPTIC COUGH & THROAT ELECTUARY	RINGWORM-GREASE & MANGE OINTMENTS
ABSORBENT OR BURSAL IODINE OINTMENT	ANTISEPTIC PESSARIES
ANTISEPTIC HEALING PLASMA DRESSING	ANTISEPTIC TEAT BOUGIES
VETODYNE ANTI-COLIC	COUGH-WORM-TONIC POWDERS
BLISTER OINTMENT & OILS	CATTLE DRENCHES, EPSOMS.
LYSOL CONCENTRATED WOUND LOTION	EMBROCATIONS – LOTIONS
	FLUID DOG SOAPS. INSECT POWDER

Packed with client's own name and address on labels. *Phone Croydon, 1718.*

ANGLO-AMERICAN PHARMACEUTICAL COMPANY LTD. GALEN WORKS, DINGWALL RD., CROYDON.

THE TREATMENT OF LIVER FLUKE

The "P., D. & Co." Male Fern Liquid Extract

(*Oleoresin Aspidium, P., D. & Co.*)

is a standardised preparation the activity of which can be fully relied on. Montgomerie, writing in the *Journal of Comparative Pathology and Therapeutics* for March, 1925, reports gratifying results in a series of trials with the "P., D. & Co." Male Fern Liquid Extract in the treatment of liver rot in Welsh mountain ewes during the winter of 1924-5.

The extract may be administered as a drench prepared by merely shaking up the required dose in an ounce of milk, or it may be given in capsules. It is supplied in bottles containing 1 ounce, also in soluble gelatin capsules containing 28 minims.

Further particulars will be sent on request.

PARKE, DAVIS & COMPANY, BEAK ST., LONDON, W.1.